THE DOCK & HARBOUR AUTHORITY

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Editorial

The Port of Cork.

The City of Cork is of Danish origin, like many other seaport towns in Ireland. In A.D. 1545, it consisted of a walled city, about 12 acres in area, situated on a marshy island between the hills at the head of the tidal waters of the River Lee, and approached through channels between other marshy islands in the river. Some of these channels are now streets. The site of the present Grand Parade lay in front of the City walls, and the City was entered by gates on the north and south at each end of the present North and South main streets. Far different is this modern Port of Cork to this marshy anchorage amidst winding channels. For geographical and other purposes, it may best be divided into two parts—the lower harbour and the upper harbour.

The lower harbour, with its great sheltered basin, where the largest fleets can lie securely at anchor, and because of its geographical position and natural advantages, is one of the finest, safest and most commodious of harbours, and contains a vast water area affording safe anchorages and shelter for the largest vessels afloat. It is situated 350 miles nearer to New York than Southampton, and as a port of call for homeward-bound ships from America or south latitude ports, whether bound for the English or Irish Channel, or as a port of embarkation or disembarkation, it stands unrivalled.

The approach to the harbour, a wide bay over five miles across, from Poer Head to Cork Head, is so sheltered from westerly gales that the mail steamers using the port can usually embark mails or passengers without entering the harbour. As many as five liners have availed of it on one day.

There are two excellent channels at the entrance to the lower harbour—the eastern and western channels—with not less than, respectively, 38 and 42 ft. at L.W.S., and a vessel has a straight run in a deep-water channel, 400 ft. broad at its narrowest point, until the Turbot Bank is passed, when an alteration in her course will bring her into a sheltered anchorage of 6½ miles long, of which an anchorage of 4,000 ft. by 2,000 ft. is specially reserved for the Transatlantic mail steamers.

The upper harbour, or river port of Cork City, has largely been created by man during the last hundred years. A hundred years ago small sailing vessels of light draft could proceed to Passage at any state of tide, and work their way to Cork on the rising tide up a channel 3 ft. deep at low-water springs. There they lay aground at various small quays or piers built on the strand to discharge their cargoes. The condition of the Cork River port must then have been very like that of an undeveloped fishing village.

In 1820 the Cork Harbour Commissioners were constituted by Act of Parliament, with powers for improving Cork River and Harbour. For the first twenty years very little work was done, except a small amount of hand dredging.

In 1840 the channel to Cork was about 4 ft. deep at low water, and the quays were simply lime mortar river walls, built on a strand dry at low water. In 1855 the first real improvement was made to the old quays when the foundations were protected by sheet piling to allow dredging to 8 ft. under low-water springs; at the same time dredging was started to give a channel 10 ft. deep at low water from Passage to Cork. The condition of things at that date was that all ships lay aground at Cork; heavier vessels stopped at Passage, put part of their cargoes into lighters for Cork, and when the drafts were sufficiently reduced proceeded to Cork and finished discharge aground. It was then supposed that dredging a channel to Cork was impossible, and on this assumption granaries were built at Passage, with rather unhappy results for the builders. In 1870 jetties were constructed at the south side of the river to accommodate oversea vessels of 18 ft. draft. The lighterage expenses from Passage to Cork, combined with other loss and inconvenience to merchants, induced the Harbour Commissioners to embark on expensive deep water quay construction and dredging for a channel 250 ft. wide and 14 ft. deep to Cork. Two Acts of Parliament were obtained, new dredging plant was purchased, and the work carried out by 1883.

In 1896 dredging improvements were continued to give a channel 350 ft. wide and 16 ft. deep at L.W.S. to Cork, with reduced widths of 280 ft. from Tivoli up. New plant was purchased; the work was started in 1897 and completed in 1902. The improved channel was laid out on a regular plan, straight where possible, and with curves improved. The result has been an improved scour, rendering the channel a naturally improving channel from Blackrock Castle to the sea. In 1903 the Custom House quays at Cork were rebuilt, and the deep water quay accommodation doubled. In 1912-1913 the anchorage for Transatlantic liners in the lower harbour was widened by dredging at the western side. In 1928 the South Jetties (timber structure) were replaced by a modern ferro-concrete structure, with piles driven to allow a depth of 30 ft. at L.W.S. for its entire length of 1,200 ft.

The deep-water quayage at Cork has, within recent years, been doubled, and there is now available 6,790 ft. of quayage with depths of between 20 and 30 ft. at L.W.S., 1,680 ft. of quayage with a depth of 16 ft. at L.W.S., and 5,300 ft. of quayage with a depth of 5 to 7 ft. at L.W.S.

The traffic at the Port of Cork has decreased considerably during the last few years. In 1928 there was a total number of vessels calling at the port of 2,383 with a total tonnage of 4,683,263, and these had decreased in 1934 to 1,541 vessels with a total tonnage of 3,718,292. The imports and exports have likewise shown a considerable decrease, imports for 1934 being 784,174 tons, as compared with 911,533 tons in 1932, and exports amounted to 66,006 tons in 1934, as against 104,884 tons in 1932. The live stock imports numbered 66 in 1932, as against 56 in 1934, but an appreciable decrease is shown in exports of live stock, for in 1932 the total was 278,264, as compared with 72,443 in 1934.

An illustrated article on the Port of Cork appears in this issue, and the Port of Cork also forms the supplement for this month.

Bidston Dock, Birkenhead.

Bidston Dock, Birkenhead, is now in normal commercial use. The first vessel to use the dock, commercially entered, was the steamer "Wiiri," which had on board about 4,500 tons of pit props for discharge at the west end of the north side of the dock for Timber and Wood, Ltd., to whom the adjoining land had been leased. About 1,640 tons were discharged in the three working days.

The Bidston Dock, which was constructed at a cost of £700,000 by the Board, was opened on 28th April, 1933. The dock, which took three years to construct, has a uniform depth of 31 feet. It has a water area of eleven acres, and is 1,000 ft. long and 400 ft. wide. It joins the West Float by a 100-ft. passage at Poulton Bridge.

Aden Port Trust

The returns of shipping using the Port of Aden for the month of May, 1935, are as follows:—

	No.	Tonnage
Merchant Vessels over 200 tons ...	146	634,460
,, ,, under 200 tons ...	5	715
Government Vessels	19	18,627
Dhows	147	4,896
PERIM.		
Merchant Vessels over 200 tons ...	18	62,399

The total value of imports, excluding Government Stores, was Rs.51,00,000/-, as compared with Rs.47,57,000/- for May, 1934, and of exports Rs.32,18,000/-, as compared with Rs.24,82,000/-.

The total value of both imports and exports together was Rs.83,18,000/-, as compared with Rs.72,39,000/- for the corresponding month last year.

Imports during the month were above those for May, 1934, in the case of gums and resins, hardware, raw hides, seeds, sugar, white and printed or dyed piece goods, unmanufactured and manufactured tobacco, and private treasure; and below, in the case of coffee, grain, pulse and flour, raw skins, grey piece goods, and twist and yarn.

Exports were above those for May, 1934, in the case of hardware, raw skins, sugar, grey, white and printed or dyed piece goods, unmanufactured tobacco, and private treasure; and below, in the case of coffee, grain, pulse and flour, gums and resins, raw hides, seeds, twist and yarn, and manufactured tobacco.

TRADE OF THE PORT.

Article.	Unit	Imports		Exports	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal	Tons	8,054	1,51,355	0	0
Coffee	Cwts.	6,392	1,77,629	6,183	2,13,959
Grain, Pulse and Flour	,,	59,847	2,93,140	38,299	1,75,599
Gums and Resins	,,	4,470	71,130	3,211	78,599
Hardware	—	0	46,889	0	35,727
Hides, raw	No.	2,235	2,698	3,327	5,019
Oil, Fuel	Tons	42,444	10,08,723	0	0
,, Kerosene	Gls.	33,328	21,912	13,560	8,787
,, Petrol	,,	16,912	12,833	360	360
Salt	Tons	0	0	14,400	1,44,000
Seeds	Cwts.	6,818	59,639	1,730	10,728
Skins, raw	No.	250,529	1,14,865	700,764	5,27,354
Sugar	Cwts.	26,870	1,28,562	20,335	95,836
Textiles—					
Piece Goods, Grey	Yds.	2,719,700	3,54,703	2,248,070	2,98,651
,, ,, White	,,	1,514,191	2,18,411	247,368	37,755
,, ,, Printed or Dyed	,,	1,985,602	3,13,246	1,088,680	2,30,391
Twist and Yarn	Lbs.	113,600	49,629	110,896	43,144
Tobacco, Unmanufactured	,,	1,596,252	3,45,384	463,120	84,932
,, Manufactured	,,	81,320	59,905	18,795	12,683
Other Articles	No. of Pkges.	64,068	11,78,425	23,359	6,25,162
Treasure, Private	—	0	4,90,354	0	5,88,650
Total ...	—	—	51,00,432	—	32,17,636

The number of merchant vessels over 200 tons that used the port in May, 1935, was 146, as compared with 146 in the corresponding month last year, and the total tonnage was 634,000, as compared with 603,000.

Excluding coal, salt, fuel oil and Military and Naval Stores and Transhipment cargo, the total tonnage of imports in the month was 10,800 and of exports 6,400, as compared with 9,700 and 6,100 respectively for the corresponding month last year.

Concrete for Dam Building

Experiments on Three Scottish Dams

A Building Research report* issued recently by the Department of Scientific and Industrial Research suggests that the discovery of a cement with a low generation of heat during setting would enable large concrete structures such as dams to be erected much more rapidly, in some cases at as much as three times the present rate, with no more risk of cracking. In a large concrete mass the heat generated by the concrete during setting cannot escape, and the difference in temperature between the surface and the interior may cause cracking in the surface layers. As evidence of the importance now attached to the selection of cements for mass concrete work, from this point of view, the report states that a special committee has been appointed by the International Commission on Large Dams of the World Power Conference to deal with the matter.

The present report describes observations carried out, in co-operation with the Department, by the consulting engineers of three large dams in course of construction in Scotland on the temperature rises during setting in the centre of the huge masses of concrete composing the dams. The dams on which this work has been done are the Laggan Dam, near Fort William, which is 700 ft. long and 138 ft. high; the Tongland Dam, near Kirkcudbright, which is about 850 ft. in length, and the Clatterinshaws Dam, across the Blackwater of Dee, which has a total length of 1,450 ft. and a height of 70 ft.

The object of the experiments was to compare the temperature rises under practical conditions for the various cements used with the results of laboratory determinations made by the methods developed at the Building Research Station. The results show that these methods are completely adequate for judging the performance of a specific cement from the point of view of temperature rise when used in mass concrete work when the heat loss is extremely slow. The report points out that the existence of high temperatures in the heart of the dam with a much lower temperature at the surface must result in higher stresses near the surface of the concrete which may cause cracking. The observations on the Laggan Dam showed that at about 10 ft. from the surface the temperature gradient might amount to about 50 deg. F., while between the heart of the dam and the air-exposed surface it might be 55 deg. F. Cracks became visible in about three weeks to one month, but had not penetrated to the inspection gallery, 8 to 11 ft. from the surface, at the end of twenty minutes. It is shown that the stresses set up due to the temperature gradient probably exceed 300 lbs. per sq. in. This value, the report states, is excessive, and if cracks are to be reduced to within reasonable limits the stresses should not exceed at the most 150 lbs. per sq. in. This in turn means that the temperature gradient should not exceed 25 deg. F. To achieve this, the rate of placing layers of concrete similar to that used in the Laggan Dam, which is made with a cement which generates 65 heat units per gram at seven days, would have to be restricted to about 6 ins. per day, that is to 3 ft. 6 ins. placed at intervals of not less than seven days.

*Building Research Technical Paper No. 18. "Correlation between Laboratory Tests and Observed Temperatures in Large Dams," published by H.M. Stationery Office, price 9d. net.

The Port of Cork

By JOHN J. HORGAN

Early History.

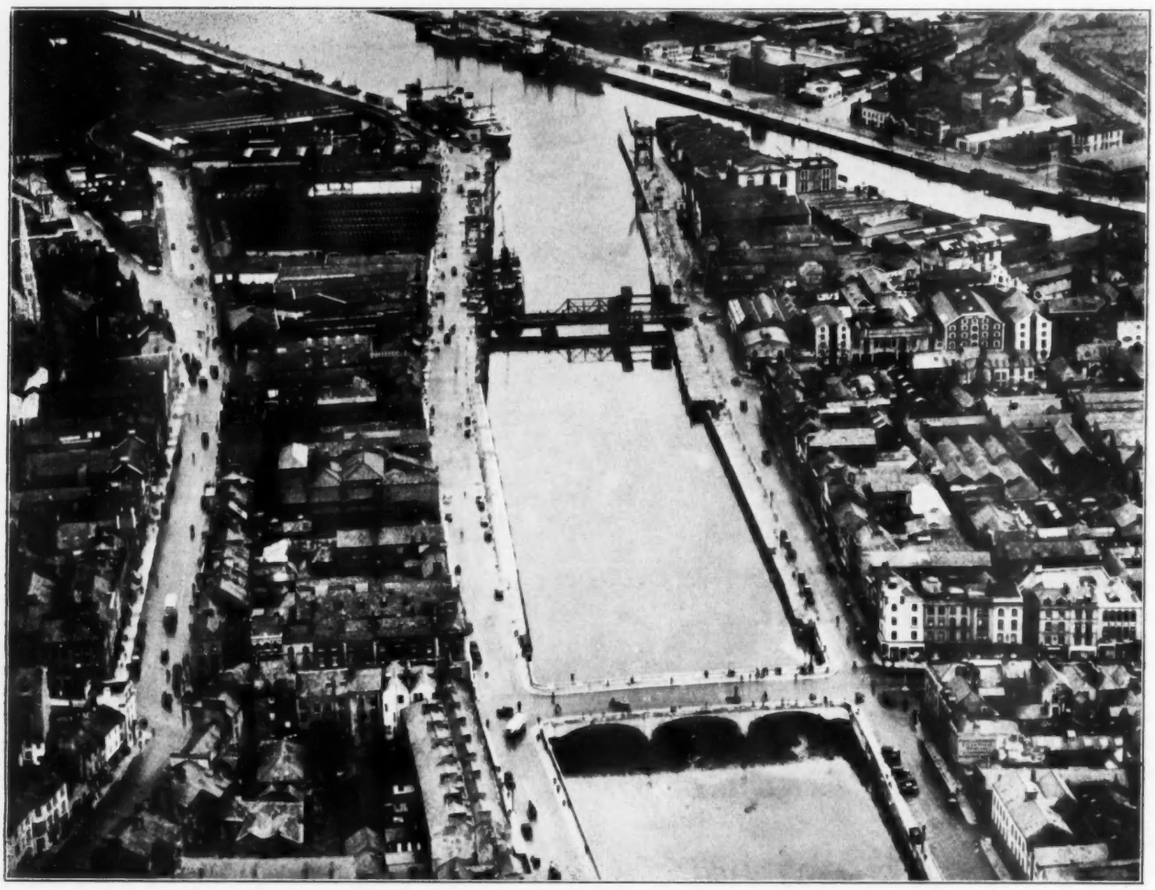
THE history of the Port of Cork has been greatly influenced by its geographical situation and economic development. Its early maritime importance is illustrated by the fact that in the year 1500 King Henry VII., by charter, granted the Mayor of Cork jurisdiction over the port. From this grant arose the quaint and ancient custom of "Throwing the Dart," in discharge of which the Lord Mayor of Cork still proceeds every three years outside the harbour entrance to a point in line with Cork Head and Poer Head, and there casts a dart into the sea, to define the limits of his authority. This ceremony has been compared to the marriage of the Adriatic to the Doge of Venice. But the port's natural development was retarded by wars and economic repression. From the invasion of the Danes, in 795 A.D., until the close of the 17th Century Ireland was in a state of perpetual unrest. With such conditions prevailing in the country, industry and commerce could not, and did not, prosper, and the ports could not develop. Moreover, the trade, especially in wool and provisions, which grew up towards the end of this period, was ruthlessly crushed by the imposition of a series of commercial restrictions enacted by the English Parliament to prevent the development of Irish commerce in directions prejudicial to England. And, in addition to destroying Ireland's external trade, the Navigation Acts created a fatal barrier to the growth of Irish shipping. By 1698 it had been virtually wiped out. The 18th and 19th Centuries witnessed a slow revival of the country's economic life, which was reflected in the gradual growth and development of the Port of Cork. Situated almost in the centre of the Southern seaboard of Ireland, facing south to the Atlantic, within easy reach of southern and western English ports, and with its fine natural harbour, the Port of Cork was bound to become an important port of call for Atlantic shipping, and the natural exit for the agricultural export trade from the South of Ireland to Great Britain. Its development is indicated by the fact that from the Port of Cork, in the year 1838, the "Sirius," which was the first west-bound steamship to cross the Atlantic, set out for America, under the command of a Corkman, Captain Roberts, and completed the crossing in the then record time of seventeen days.

Overseas Shipping discharging at South Jetties, Cork.

Modern Development.

In 1820 the first constructive step to improve the port was taken when the Cork Harbour Commissioners, which still control its management, were constituted under an Act of Parliament. At that time, and for many years afterwards, the accommodation for shipping in the Upper Harbour, or river port, was of very antiquated kind, and quite inadequate to meet the steadily developing requirements of its shipping and trade. The depths of the Channel from Blackrock to Cork at this time varied from 3 to 6 ft. at low water. Farther down the river, from Lough Mahon to Horse Head, near Passage, the depths were 9 to 12 ft. These were the natural depths of the channels, produced by the river scour and tidal currents, without any artificial aids. There were no lighthouses or buoys to mark the channels, and vessels of 15 ft. draft could only get up to Cork on spring tides. At neap tides only vessels of 12 ft. draft could do so. At the Cork quays all vessels had to lie aground, the larger ships some distance from the quay. In heavy floods there was always a risk of vessels breaking from their moorings. All oversea vessels had to anchor at Passage, about half-way to Cork, where about half the cargo was discharged into lighters for carriage to Cork, the remainder being brought up in the ships after their draft had been reduced to 12 ft. From 1850 onwards a steady improvement took place in this state of affairs. A dredger was procured, and dredging commenced, the dredged material being put into wooden barges, from which it was wheeled ashore to form the present Marina Embankment, which runs along the south bank of the river approaching Cork. In 1855 improvement works were undertaken at the Cork quays, to allow for a depth of from 5 to 7 ft. at low water alongside. Lighting and buoying was provided at the same time in the river channel from the Lower Harbour to Cork. Dredging was also carried on continuously to provide a channel 11 ft. deep from Passage to Cork. This channel was completed in 1877. In 1874 the first attempt was made to allow oversea vessels to discharge afloat at Cork. This consisted in constructing a number of timber jetties along Victoria Quay, at the south side of the river, and dredging to 20 ft. depth at low water alongside. This work was completed in 1875, and gave a 1,000 ft. of deep water berthage. Subsequently these jetties were improved and extended. In 1876 more modern dredging plant was purchased, and the channel from Passage to Cork dredged to a depth of 14 ft. and a width of 250 ft., thus opening up the approach to the Upper Harbour. In 1875 and 1877, Acts of Parliament were obtained, authorising the Harbour Commissioners to extend further the deep water quays at Cork, and to build a deep water quay at Queenstown (now Cove), the town on the Lower Harbour. By 1884 all these quays were completed and in use. The increase of trade made it necessary, in 1894, to construct further timber wharves at St. Patrick's and Penrose Quays, with 13 ft. of water alongside, which accommodated cross-Channel steamers, and allowed them to sail and berth at any time, except for about three hours at low water. At the same time it was decided to make the channel 16 ft. deep from Passage to Cork, with a width of 350 to 280 ft., the object being to make it navigable for cross-Channel steamers at low water. To carry out this work a new dredger and two twin-screw hopper barges were purchased in 1896, and the work of dredging this channel was finished in 1904. The improved channel was laid out on a regular plan, straight where possible, and with curves improved. The result has been an improved scour, rendering the channel naturally improving from Blackrock Castle to Passage. In 1903 the deep water berthage at Cork was further extended, giving a total berthage of 3,300 ft., with a depth of 22 ft., which more than doubled

Port of Cork—continued



Photo] *Junction of North and South Channels, Cork, with Patrick's Bridge in foreground.* [Aerofilms, Ltd.

the accommodation for oversea vessels. In the matter of buoys and lights a gradual improvement was also effected. The dredged material from the river channel was formerly removed to sea, but, in 1919, the Commissioners purchased 155 acres of slob land from the Board of Trade, on the northern bank of the river, adjacent to the city, and since then have pumped most of the mud from the hopper barges ashore at this point, behind a retaining bulkhead. The objects of this scheme—concerning which there has been much controversy—are, first, to save the expense of removing the material 35 miles to sea as formerly, and, second, to form land suitable for harbour and industrial development works, such as quays, stores and factories. Considerable reclamation has already taken place, and generally it may be said that the scheme has justified itself. The whole area can be provided with railway sidings, as it is adjacent to the main line of the Great Southern Railways, and situated at a point on the river where vessels up to 600 ft. in length can be swung without difficulty. In 1930 the South Jetties, a timber structure, were replaced by a modern ferro-concrete jetty, to allow a depth of 30 ft. at low water.

The Lower Harbour.

Whilst the Port of Cork is one administrative unit, it really consists of two distinct areas, namely, the Lower Harbour, with its great sheltered basin, where a large fleet can lie securely at anchor—one of the finest, safest, and most commodious of natural harbours; and the Upper Harbour, or artificially-created river port, which comprises the river approach from Passage to Cork and the Cork City quays. The ocean approach to the Lower Harbour, a wide bay over five miles across from Poer Head to Cork Head, is so sheltered that in reasonably fine weather the American liners usually embark mails and passengers from tenders without entering the harbour at all. From this open bay the entrance to the Lower Harbour proper is through an estuary about 5,000 ft. wide at the entrance, which is not obstructed by a bar, and consists of two short channels with a minimum depth of 38 ft. at L.W.O.S.T. in the Eastern Channel, and of 42 ft. in the Western Channel, the former, however, being taken usually by large vessels, as it is straighter than, though not so deep as, the Western Channel. The channels are divided by a rock, known as the Harbour Rock, the position of which is marked by lighted buoys. Leading lights and marks are provided to enable either channel to be navigated in safety. After passing the Harbour Rock the two channels merge into one broad channel, which, about a mile inside the entrance, forms the liner anchorage of 4,000 ft. by 2,000 ft., with a minimum depth of 36 ft. at L.W.O.S.T., specially reserved for the Trans-Atlantic liners. In 1912-13 this anchorage was widened by dredging at the western side. A short distance north of the liner anchorage the channel turns westward, and shoals to 30 ft. at low water; afterwards deepening to about 60 ft. as far as Passage. At Cove the Harbour Commissioners own the Deep Water Quay, already referred to, alongside which the depth at L.W.O.S.T. is 24 ft. This quay is adjacent to the railway station, and here the tenders from the Trans-Atlantic liners berth and receive or discharge passengers and mails.

The Upper Harbour.

At Passage, where the Upper Harbour begins, the channel is about 1,000-ft. wide, with depths up to 52 ft. at low water, but from Horse Head, north of Passage, the remainder of the channel to the quays at Cork is, as already described, practically an artificial ship canal, marked by buoys, with a minimum depth of 16 ft. at L.W.O.S.T. Seventy-five years ago, as we have seen, the minimum depth was only 3 ft., and this tremendous improvement is the best proof of the enterprise of the Harbour Commissioners and their advisers. This work, which has cost from first to last over £466,000, has been carried out by local loans amounting to £390,000, and out of port revenues. Of the amount thus borrowed £226,345 has been paid off, leaving a balance outstanding at 31st December, 1934, of £163,655, against which there is to credit of the Sinking Funds a sum of £80,367. In the Upper Harbour, or Cork City river port, deep-water berthage is provided which enables vessels drawing up to 30 ft. fresh-water draft to remain afloat at all stages of the tide. The total length of the quay frontage at Cork is now 13,773 ft., of which 6,793 ft. represents deep-water quays. All the quays are the property of the Harbour Commissioners, with the exception of one concrete wharf, which has been purchased from them by Messrs. Henry Ford and Son, Ltd. At Cove the total length of the quays is 890 ft., of which 600 ft. are deep-water. The channel at the north and south deep-water quays at Cork City is 491 ft. wide, but higher up the river divides into two—the North Channel, which is about 220 ft. wide, and the South Channel, which is less than 200 ft. wide at its broadest point. Vessels which can use the Upper Harbour must not, therefore, exceed about 450-ft. in length.

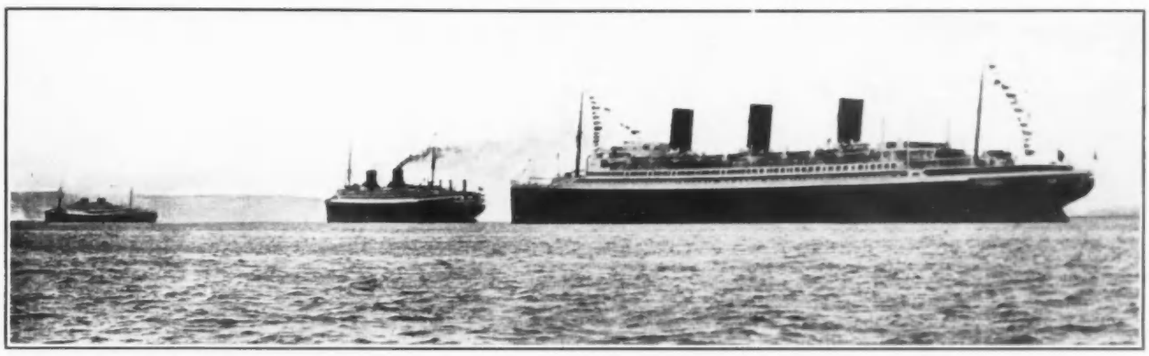
Port of Cork—continued

The Port Authority.

The Cork Harbour Board, as at present constituted, consists of the Lord Mayor and five Parliamentary representatives of the city, with thirty other members elected by the Cork Corporation. Five of these are elected direct from the Corporation itself, twenty-two as representing the mercantile community, and three as representing the Lower Harbour.

Cargo Handling.

The arrangements for handling cargo in the Upper Harbour consist of a 25-ton electric fixed transporter crane on the Custom House quay, which is the property of the Harbour Commissioners, four electric transporter cranes of from 2½ to 5 tons capacity, which are operated by the City of Cork Steam Packet Co., Ltd., and a 40-ton steam sheer-legs at the Commissioners' repairing yard, which is available for heavy lifts. There are also seven steam cranes on floating plant, owned by the Commissioners. In addition, there are four 30-cwt. hydraulic cranes, owned by the Great Southern Railways Company, on the north quays, which are used for discharging coal into railway wagons. On the north Deepwater Quay the Commissioners constructed, in the year 1919, a corrugated iron transit shed, which has been let to a shipping firm that carries on direct trade with America and the Continent. The various cross-Channel companies using the port have store and warehouse accommodation of their own on the quays near their berths, and the Cork Bonded Warehouses provide extensive accommodation for dutiable goods.



From Left to Right: Transatlantic Liners "Britannic" 26,943 tons, "Columbus" 32,565 tons and "Ile de France" 43,153 tons in Cork Harbour.

Lower Harbour Development Plans.

The Commissioners have on several occasions investigated the development of the Lower Harbour. In 1922, Mr. George F. Nicholson, Chief Engineer to the Port of Seattle, U.S.A., on their behalf, made a comprehensive examination and report on the subject. He suggested that the Western Channel should be improved by dredging the western point of the Harbour Rock to a depth of 40 ft. at low tide, and by eliminating the Turbot Bank and other obstructions. He also proposed a deep-water pier at Cuskinny, near Cove, with transit sheds, warehouses, cold storage plant, grain elevator, and all the equipment of an up-to-date cargo-handling port, including connection with the railway. These works would have cost from a million to a million-and-a-quarter pounds, and the impossibility of obtaining such a sum, owing to the disturbed state of the country, proved a fatal obstacle to carrying them out. In the following year the Commissioners obtained a report, on Mr. Nicholson's proposals, from Messrs. Meik and Buchanan, Engineers, London, one of whom, Mr. Meik, had been familiar with the harbour for many years, and had made a special report on it in 1913. Messrs. Meik and Buchanan, whilst agreeing with the proposal to widen the Western Channel, opposed any interference with the Harbour Rock, on the ground that it acts as a breakwater, and, whilst they saw no objection to the rest of Mr. Nicholson's scheme, provided funds were available, they appeared to doubt whether the proposed new port at Cuskinny on the larger lines contemplated was, in all the circumstances, an economic proposition. They suggested the consideration of an alternative scheme, which provided for a deep-water pier at Cuskinny, to accommodate, in the first instance, one ocean liner, and, with transit sheds and cranes, to cost about £400,000. This scheme represented a very considerable reduction on that proposed by Mr. Nicholson, but the Commissioners did not feel that the business likely to be attracted by such a pier would warrant this heavy expenditure—certainly not if the port's own resources were to be solely responsible for finding the money. In any event, before such an undertaking was decided on, it would be necessary to obtain definite guarantees from the transAtlantic shipping companies concerned that they would avail themselves of such a pier, and these have never been forthcoming.

Air Port.

The possibility of the Lower Harbour being developed in the near future as a base for a seaplane or aeroplane service with Great Britain and the Continent has been frequently referred to during recent years, and it has been pointed out that an appreciable saving of travellers' time, and greater speed in the delivery of Continental mail, could be achieved if passengers and mails from Canada or the U.S.A. by vessels calling at Cork Harbour could complete their journeys to British or Continental ports by air. On several occasions special planes have been chartered for this purpose, and have carried out such journeys successfully and expeditiously. There is little doubt that, with the progress of aviation, air services by sea or land planes, or both, will before long be run in connection with the sailings of the great trans-Atlantic liners from every port of importance, just as naturally and as regularly as railway connections are provided at present. Cork Harbour is most favourably situated for such a service, and possesses all the physical attributes necessary for a safe and satisfactory seaplane base. It is also nearer by air to all the principal European capitals than any other competing Irish ocean port. The American Navy had a seaplane base at Aghada on Cork Harbour during the Great War. The matter has already been the subject of consideration and enquiry by the Harbour Commissioners, the Royal Dutch Air Lines, Imperial Airways, and the Cork Aero Club. Various proposals have been made, including the establishment of an aerodrome at the back of the Great Island, on which Cove is situated, under conditions which would provide accommodation for aeroplanes, but, so far, no definite or satisfactory solution has been found, and the project of providing a satisfactory Cork air port remains undecided.

Dock Accommodation.

The dock accommodation available in the port has been, unfortunately, much reduced in recent years. The fine graving dock at Rushbrooke, which was equipped with modern shipbuilding and repairing equipment, was dismantled in 1932 owing to lack of work, and the dock at Passage, on the other side of the river, is also closed down. At Haulbowline, in the Lower Harbour, opposite Cove, is a well-equipped dockyard, served by large steam cranes and extensive engineering shops, the dock having an overall length of 608 ft. and an entrance width of 92 ft. The channel leading to this dock has a depth of 25 ft., and can be used therefore by vessels of deep draft. It was formerly the property of the British Admiralty, and used for naval purposes. In 1922 the yard was transferred to the government of the Irish Free State, and was subsequently leased to Haulbowline Industries, Ltd. It is still available for ship repairing. On Haulbowline Island there is also large oil storage accommodation, and an oil refinery plart is being erected. In the Upper Harbour the Harbour Commissioners' Yard affords facilities for repairs to small vessels, as well as the Commissioners' floating plant.

Pilotage.

The Pilotage Authority are the Cork Harbour Commissioners, who maintain an efficient pilotage service off the port by motor boats carrying wireless equipment. The pilots engaged are carefully examined, and must prove themselves competent for the work. They are divided into special trans-Atlantic pilots, Lower Harbour pilots, river pilots, and masters and mates of cross-Channel steamers holding pilotage certificates.

Port of Cork—continued

Steamer Services.

Regular lines of steamers ply between the Port of Cork and London, Liverpool, Plymouth, Southampton, Manchester, Fishguard (three times a week), Glasgow, Waterford, Dublin, Belfast, Antwerp, Amsterdam, Rotterdam, Bremen, Gothenburg, and Le Havre. The principal lines engaged in these services are the City of Cork Steam Packet Company, originally a Cork-owned company, and now a subsidiary of Coast Lines, Ltd., and the Clyde Shipping Company, Ltd. In addition, there is a regular weekly service by several trans-Atlantic lines between Cork Harbour and New York and Boston. These lines also carry passengers to Southampton, Liverpool, London, Cherbourg, Hamburg and Le Havre. This service is carried on by the Cunard White Star, Hamburg-American, North German Lloyd, and United States lines. Passengers and mails from these liners are landed by tender at Cove, alongside a fast main line train service to all parts of the country. The Great Southern Railway terminus at Cork is also adjacent to the quays, and provides complete transport facilities for all goods and passengers landed at the river port. The situation of the Port of Cork in the centre of a great agricultural and live-stock district has made it inevitable that its principal exports should be those of provisions and live-stock to Great Britain. Bacon, butter, eggs, poultry, milk and cream, are all exported in large quantities.

Industrial Activities.

For over two centuries Cork City and County has been the seat of an extensive brewing and malting industry, and two breweries give extensive employment. The distillery industry is also long established, and Cork whiskey is well known all over Ireland, Great Britain and the Dominions. Mineral water is also manufactured and extensively exported. The district is also famous for the manufacture of woollen goods, and there are many woollen mills in the area served by the port. The Blarney tweeds and knitting yarns, as well as the specialised products of many of the other mills, are known throughout the world. There are also several large clothing factories. The bedding industry is an important one, and there is a large export trade in curled hair, feathers, and down quilts. Fertilisers are produced on a large scale, as well as fine chemicals, colours, paints, varnishes, polishes and printing inks. In addition, there is a large boot and shoe factory, rope works, a modern soap factory, and several minor industries. But the most important industrial development in recent years has taken place on the south side of the river port. In 1917, Mr. Henry Ford, whose father was a native of Cork County, purchased the large area adjacent to the river known as the Cork Park, which, up till then, had been used as a race course, together with the adjoining deep-water quay, which had just been constructed by the Harbour Commissioners. On portion of this site of over 120 acres Henry Ford and Son, Ltd. (a company formed by Mr. Ford for this purpose), erected a large modern factory for the manufacture of agricultural and industrial tractors for the European market. The economic condition of Europe, and the exchange and tariff difficulties after the war, hampered the success of this project, and, after a few years, it was changed into a factory for the purpose of manufacturing motor car engines and axles to supply the Ford factory at Manchester. After the setting up of the Irish Free State this became impossible, owing to the tariff restrictions between the Free State and Great Britain, and the factory was once more devoted to the manufacture of Ford tractors for the entire world market. In 1930 this tractor factory was removed to the new Ford factory at Dagenham, in England, and the Cork factory turned into a motor car assembly plant for the Irish Free State. At one period this factory employed several thousand men, and still gives considerable employment.

Marina Industrial Estate.

Being unable to use the entire property themselves, the Ford Company are now developing it as an industrial estate, with considerable success. Already lettings have been made to several large industrial firms, who have established factories and other works. Amongst these may be mentioned the Irish Dunlop Company, Ltd., which is manufacturing tyres and other rubber goods for the entire Free State; Metal Products, Ltd., which manufactures nuts and bolts; Shell, and B.P., Ltd., Russian Oil Products, Ltd., and the National Flour Mills, Ltd., who are erecting on the estate a grain silo for their adjacent flour mill.

In view of the settled national policy of developing Irish industries, there will undoubtedly be an increasing demand for factory sites in the Free State, and the Marina Industrial Estate offers one of the most suitable situations in the Irish Free State for such development, including, as it does, both suitable buildings and sites for new factories. The estate has its own deep-water wharf, over 1,600 ft. long and 100 ft. wide, capable of accommodating vessels of 6,000 tons, and equipped with two up-to-date transporter cranes, each capable of unloading cargo at the rate of 100 tons an hour. It is also supplied with electric power from the Electricity Supply Board transformer station on the estate, as well as water and gas from the Cork Corporation and Gas Company. The estate is intersected by the fine public avenue known as the Centre Park Road, with frontages of nearly 9,000 ft. Other industrial sites, including about 8 acres at the Tivoli reclamation site, are also available in various parts of the city.

Flour Mills.

Adjacent to the Marina Estate on Victoria Quay are the two fine modern flour mills of the Cork Milling Company, Ltd., and National Flour Mills, Ltd. The Cork Milling Company has recently erected a grain silo of the most modern type, with a total capacity of 12,500 tons, and the National Flour Mills, Ltd., whose fine new mill has been built during the last few years, are also erecting a large silo, as already mentioned. This extension and development of the flour milling industry is due to the economic policy of the Government, which aims at the complete exclusion of foreign flour and wheat. But it will also seriously reduce the port's revenue owing to the decrease of grain imports, a substantial source of harbour dues.

Future of the Port.

The tariff policy of the Government, and the dispute with Great Britain over the land annuities, have also re-acted seriously on the agricultural community, and decreased the exports and imports through the Port of Cork, with the result that the revenue of the Harbour Commissioners has recently been considerably reduced, and they have been forced to curtail expenditure as far as possible. In the current year, a reduction of some £9,000 in revenue is anticipated, and, if this process continues, the port may require assistance from the national government to maintain its present services. It is well to remember that, whatever industrial development may take place in Ireland, the basis of the prosperity of the Port of Cork is and must remain its agricultural export trade. The town of Cove, on the Lower Harbour, has also suffered severely as the result of modern inventions and political developments. Its one-time prosperity was based on its position as a port of call, its naval dockyard, the British naval and military garrisons, and the emigration traffic to America. One by one these foundations have been destroyed. The virtual abolition of the sailing ships and the invention of wireless telegraphy has terminated the calling of ships for orders, the larger liners moved to Southampton and stopped calling at Cork Harbour, the Treaty of 1921 practically removed the British military and naval forces and virtually closed the dockyard at Haulbowline, and, finally, the United States and the Dominions national policy stopped emigration. In spite of these difficulties the Port of Cork remains the finest harbour in the Irish Free State, and those responsible for its administration are anxious and willing to take every advantage of its position, and to lose no opportunity of advancing its prosperity. It combines within its waters every aspect of port activity, being at one and the same time an ocean port, a cross-Channel port, a river port, a port of call, a terminal port, and a port of transit. As regards auxiliary services, it is both a rail port and a lorry port. Few ports combine all these services so completely, and few are by force of natural position and economic forces so wide in their functions. Some idea of the port's recent trade and development will be gathered from the following tables:—

1.—VOLUME OF TRADE.

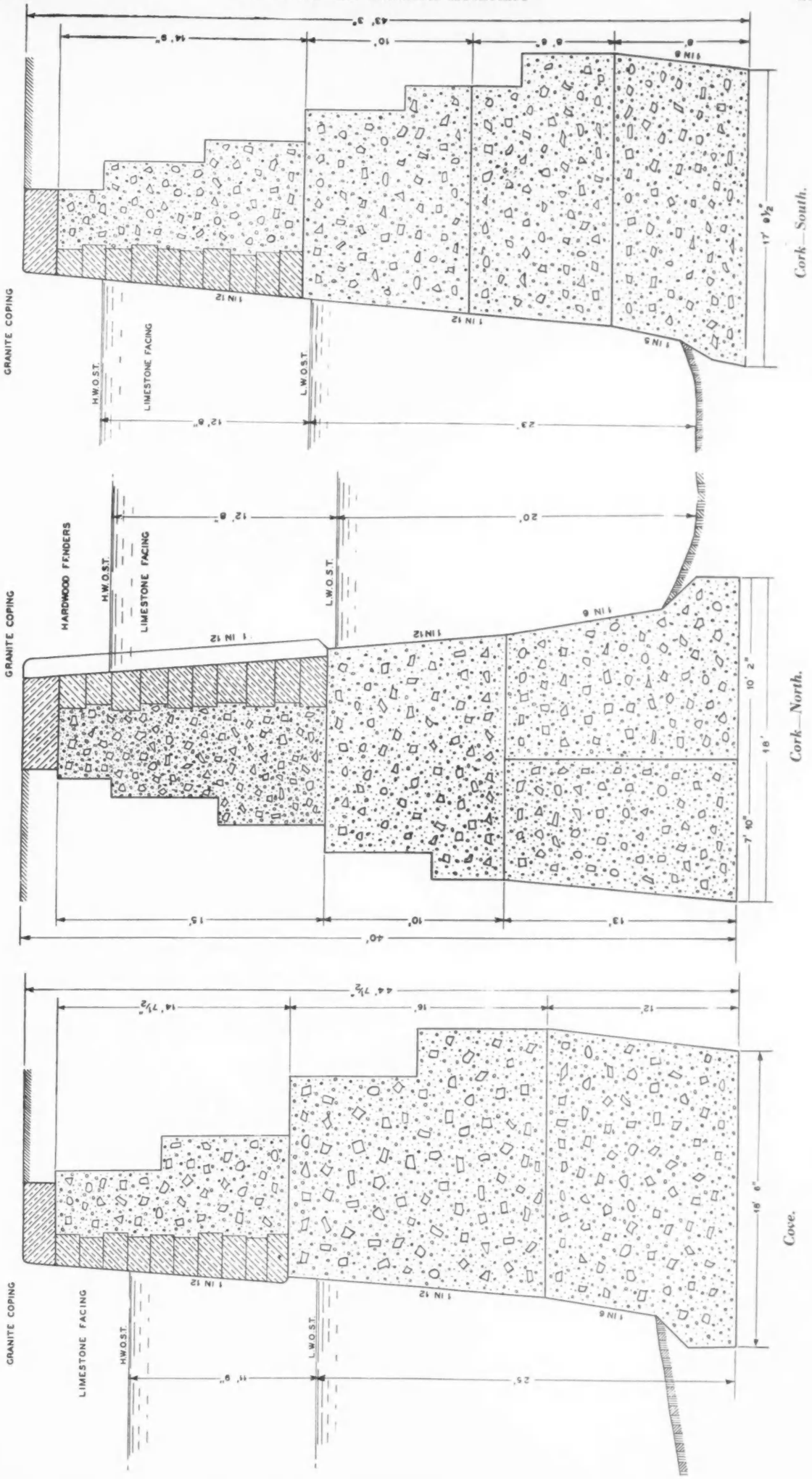
	NO. OF VESSELS			TONNAGE OF VESSELS		
Year	Transatlantic Liners, etc.	Other Vessels	Total	Transatlantic Liners, etc.	Other Vessels	Total
1903	509	2,127	2,636	(a) 1,671,790	658,541	2,330,331
1913	449	1,986	2,435	(a) 2,292,349	802,700	3,095,049
1924 (b)	264	1,936	2,200	(a) 1,792,629	818,729	2,611,358
1925	426	1,768	2,194	3,710,805	730,608	4,441,413
1926 (c)	431	1,370	1,801	3,552,389	670,807	4,223,196
1927 (c)	453	1,755	2,208	3,937,018	739,560	4,676,578
1928	424	1,959	2,383	3,932,432	750,831	4,683,263
1929	408	1,831	2,239	3,621,048	809,162	4,430,210
1930	355	1,933	2,288	3,090,310	982,433	4,072,743
1931	292	1,840	2,132	2,519,565	992,847	3,512,412
1932	283	1,704	1,987	2,717,783	955,681	3,673,464
1933	280	1,318	1,598	2,868,384	834,184	3,702,568
1934	302	1,239	1,541	2,847,440	870,852	3,718,292

(a) Not including Tonnage entering the Port on homeward voyage.
(b) The Dockers Strike affected this period.
(c) The Coal Strike affected these periods.

	GENERAL GOODS		LIVE STOCK	
	Imports	Exports	Imports	Exports
1903 (a) ...	692,564	109,789	—	282,354
1913 (a) ...	831,655	114,598	336	187,212
1931 (b) ...	879,109	85,704	150	261,470
1932 (b) ...	911,533	104,884	66	278,264
1933 (b) ...	710,149	89,319	21	86,574
1934 (b) ...	784,174	66,606	59	72,443

(a) Not including Timber and Goods charged by number.
(b) Not including Goods charged by number.

Port of Cork. Cross Section of Deep Water Quays.



Port of Cork—continued

2.—RECEIPTS AND EXPENDITURE.

	1911	1912	1913	Average 1911-13
	£	£	£	£
Receipts ...	50,979	49,848	53,205	51,344
Expenditure ...	50,277	54,392	50,897	51,855
Surplus ...	702	—	2,308	—
Deficiency ...	—	4,544	—	511

	1932	1933 (a)	1934 (a)	Average 1932-34
	£	£	£	£
Receipts ..	87,015	78,409	86,291	83,915
Expenditure ...	93,060	78,089	81,993	84,380
Surplus ...	—	320	4,298	—
Deficiency ...	6,015	—	—	465

(a) The expenditure during 1933 and 1934 was subnormal on account of reductions in working hours of Staff and other economies to meet reduction in revenue owing to trade depression.

	Average 1911-13	Average 1932-34	Increase Amount	Increase Per Cent.
Receipts —	£	£	£	
Dues on Vessels	25,999	33,060	7,061	27·1
Rates on Goods	23,895	46,786	22,891	95·8
Miscellaneous ...	1,450	4,069	2,619	180·6
	51,344	83,915	32,571	63·4
Expenditure ...	51,855	84,380	32,425	62·5
Surplus ...	—	—	—	—
Deficiency ...	511	465	—	—

3.—BALANCE SHEET.

LIABILITIES	1913 £	1934 £	Increase £	Decrease £
Stocks and Loans	253,955	163,655	—	90,300
,, ,, (Pilotage) ...	8,000	—	—	8,000
Government Grants	—	6,000	6,000	—
Sundry Creditors	1,447	6,924	5,477	—
Cash due to Bankers	2,275	20,558	18,283	—
Miscellaneous Accounts ..	1,902	4,857	2,955	—
Reserve Contingency and Insurance Fund	36,910	22,021	—	14,889
Reserve Depreciation of Plant	6,679	27,190	20,511	—
Sinking Funds	30,225	78,839	48,614	—
Reduction of Debt Account ...	61,203	226,345	165,142	—
Contributions to Capital Outlay	—	58,690	58,690	—
Net Revenue Account (Aggregate Surplus)	5,043	—	—	5,043
			325,672	118,232
	407,639	615,079	207,440	—

ASSETS				
Harbour Estate, Plant, etc. ...	299,161	454,690	155,529	—
Depreciation of Plant Fund, Investments, etc.... ...	22,199	27,190	4,991	—
Pilotage Funds	11,487	—	—	11,487
Reserve Contingency and Insurance Fund, Investments, etc.	36,910	22,021	—	14,889
Sinking Funds, Investments, etc.	30,226	78,839	48,613	—
Stores, etc.	2,754	3,112	358	—
Cash at Bankers and in hand	3,824	118	—	3,706
Sundry Debtors	1,078	4,435	3,357	—
Net Revenue Account (Aggregate Deficiency	—	24,674	24,674	—
			237,522	30,082
	407,639	615,079	207,440	—

In what direction the Port of Cork will develop in the future it is idle to speculate here, but develop it must and will, and there is no reason to doubt that the same spirit of watchful enterprise which inspired its citizens in the past will continue, and that it will retain and justify with every right its proud motto: "*Statio bene fida carinis.*"*

The Port of Copenhagen

The number of ships which entered the Port of Copenhagen during May, 1935, was as follows:—From inland ports 1,405 steam and motor ships arrived of 181,275 n.r.t., and 15 sailing vessels arrived of 3,615 n.r.t. Shipping arriving from foreign ports amounted to 821 steam and motor ships of 382,375 n.r.t., and 17 sailing vessels of 2,298 n.r.t. The total of steam and motor ships and sailing vessels arriving from both inland and foreign ports for May amounted to 2,258 vessels of 569,593 n.r.t.

* "A safe harbour for ships."

Lloyd's Register Shipbuilding Returns for the Quarter ended 30th June, 1935

THE statistics issued by Lloyd's Register of Shipping regarding merchant vessels under construction at the end of June last show that in Great Britain and Ireland there is an increase of 4,506 tons in the work in hand, as compared with the figures for the previous quarter. The present total of tonnage under construction—560,321 tons—is, however, 26,821 tons less than the tonnage which was being built at the end of June, 1934, but exceeds the aggregate tonnage now under construction in the five leading countries abroad.

The tonnage on which work was suspended at the end of June last amounted to 23,288 tons, being composed entirely of steamers.

About 79,000 tons—14 per cent. of the tonnage now being built in this country—are intended for registration abroad or for sale.

The tonnage now under construction Abroad*—722,210 tons—is about 8,500 tons more than the work which was in hand at the end of March last, and is the highest quarterly total recorded since June, 1932. Tonnage, included in the total in hand abroad, on which work has been suspended amounts to 1,000 tons of steamers and 8,745 tons of motor-ships.

The leading countries abroad are:—Germany, 237,045 tons; Sweden, 94,473 tons; Holland, 75,446 tons; Japan, 65,970 tons, and Denmark, 65,753 tons.

The total tonnage under construction in the World* amounts to 1,282,531 tons, of which 43.7 per cent. is being built in Great Britain and Ireland, and 56.3 per cent. abroad. The quarterly total for the world shows an increase of about 13,000 tons over the figures at the end of March last, and is, with the exception of that for September last, the highest since March, 1932.

In Great Britain and Ireland, 108,122 tons were commenced during the last three months, a decrease of 36,264 tons, compared with the corresponding total for the March quarter. During the quarter ended June, 1935, 116,011 tons were launched in Great Britain and Ireland, an increase of 9,914 tons, as compared with the previous quarter. Similar figures for abroad are 279,311 tons commenced, and 206,974 tons launched, showing, as compared with the previous quarter, an increase of 102,030 tons in the tonnage commenced, and of 33,808 tons in the tonnage launched.

Steam and motor oil tankers under construction in the world amount to 41 vessels of 328,036 tons, of which 9 vessels of 85,000 tons are being built in Germany, 8 vessels of 55,740 tons in Holland, 5 vessels of 42,900 tons in Sweden, 5 vessels of 32,680 tons in Great Britain and Ireland, 3 of 26,603 tons in Japan, 3 of 24,511 tons in the United States of America, and 2 of 18,800 tons in Denmark.

Of the 560,321 tons under construction in Great Britain and Ireland at the end of June, 243,996 tons consisted of motor-ships, while at the same date the motor-ship tonnage being constructed abroad (507,124 tons) was 297,293 tons in excess of that of the steamers.

The vessels being built in the world at the end of June include 5 steamers and 8 motor-ships of between 8,000 and 10,000 tons each; 6 steamers and 25 motor-ships of between 10,000 and 20,000 tons; and 3 steamers and 2 motor-ships of 20,000 tons and upwards.

The table respecting marine engines shows that the horse-power of steam engines now being built or being fitted on board amounts to about 572,000 h.p.; this figure includes 46 sets of turbine engines of about 423,000 shaft horse-power. The horse-power of the steam reciprocating engines (about 149,000 h.p.) amounts to 11.8 per cent. of the total horse-power of marine engines now being built in the world. The figures for oil engines aggregate approximately 698,000 h.p.

Tonnage to Lloyd's Register Class.—Of the merchant shipbuilding in hand throughout the world at the end of June, 929,038 tons, or over 72 per cent., are being built under the inspection of Lloyd's Register. Of this total, 532,348 tons, representing more than 95 per cent. of the tonnage being built there, are under construction in Great Britain and Ireland; while, of the tonnage being built abroad, 396,690 tons, or 55 per cent., are being constructed under the inspection of Lloyd's Register.

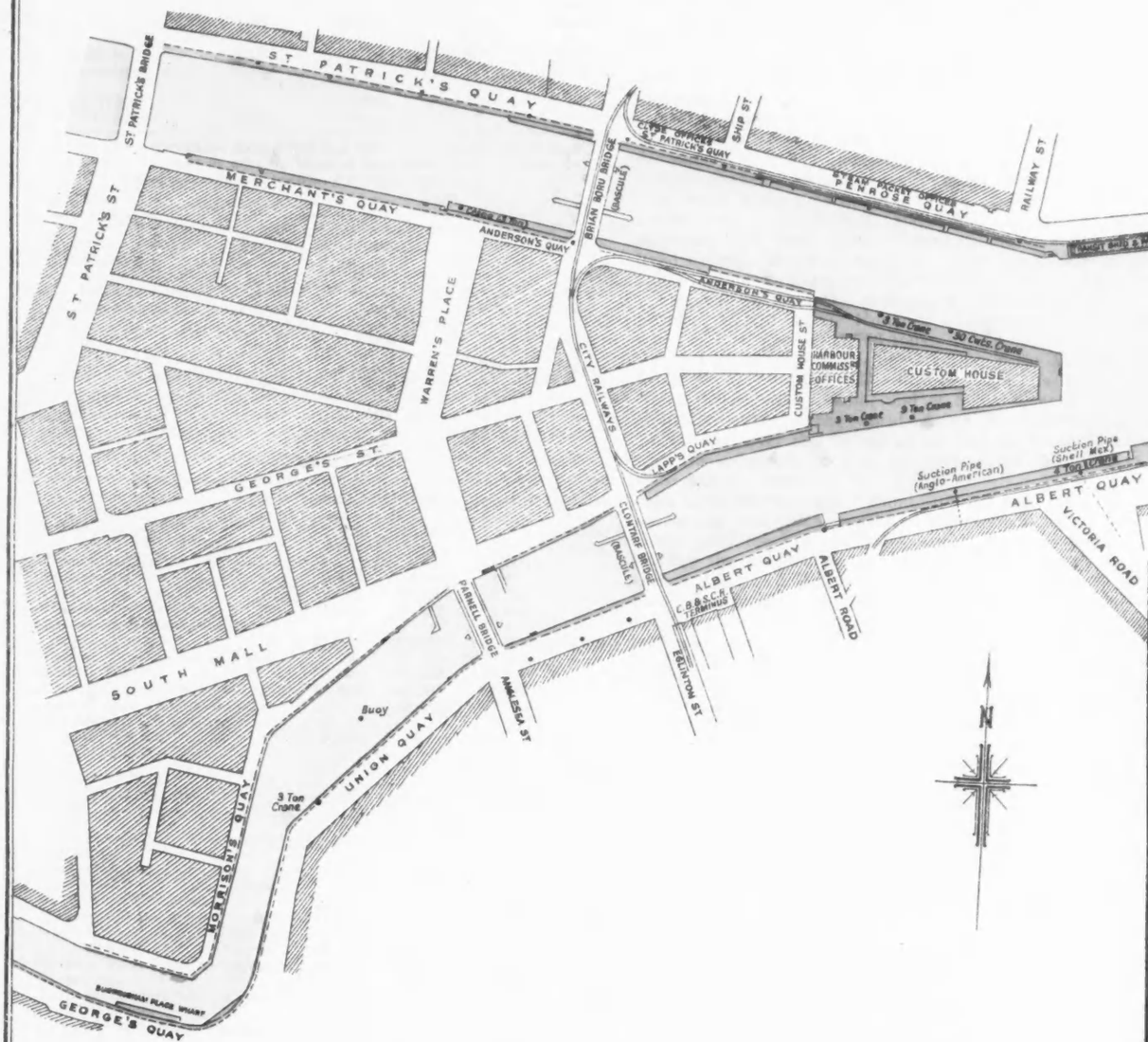
The Institute of Transport

At the invitation of the Birmingham and District Section it has been decided to hold the next Congress of the Institute of Transport at Birmingham from May 20th to May 23rd, 1936.

*Excluding Russia, for which no figures are available.

PORT OF CORK.

UNDER THE JURISDICTION OF THE CORK HARBOUR COMMISSIONERS.



NOTE ;- *The Quays under control of the Harbour Commissioners are coloured RED .*

PLAN OF CORK QUAYS.

Scale.

FEET 100 50 0 100 200 300 400 500 600 700 800 900 1000 FEET

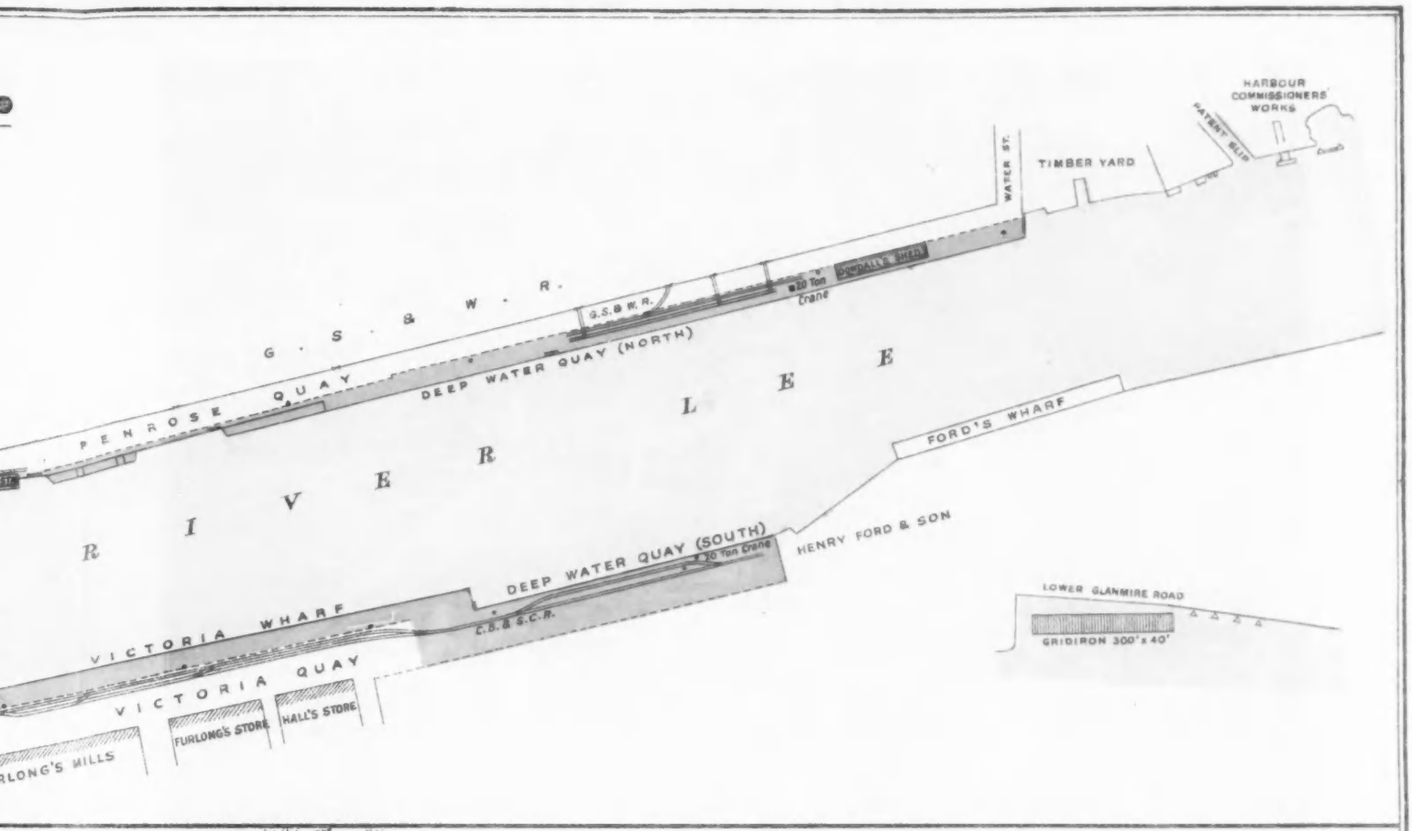
CORK

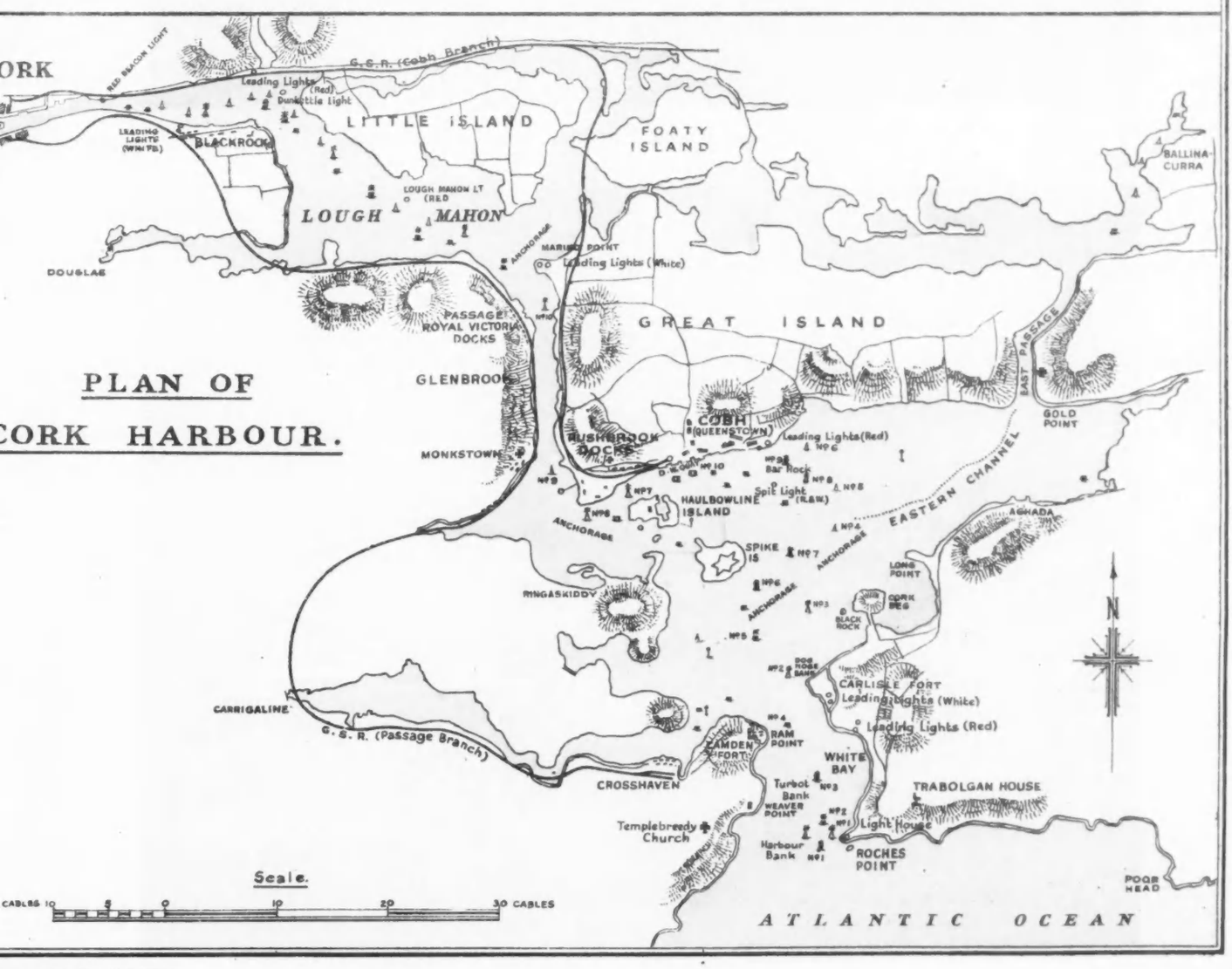
CORK

CABLES 10

WARD & FOXLOW, LITHO HARCOURT S

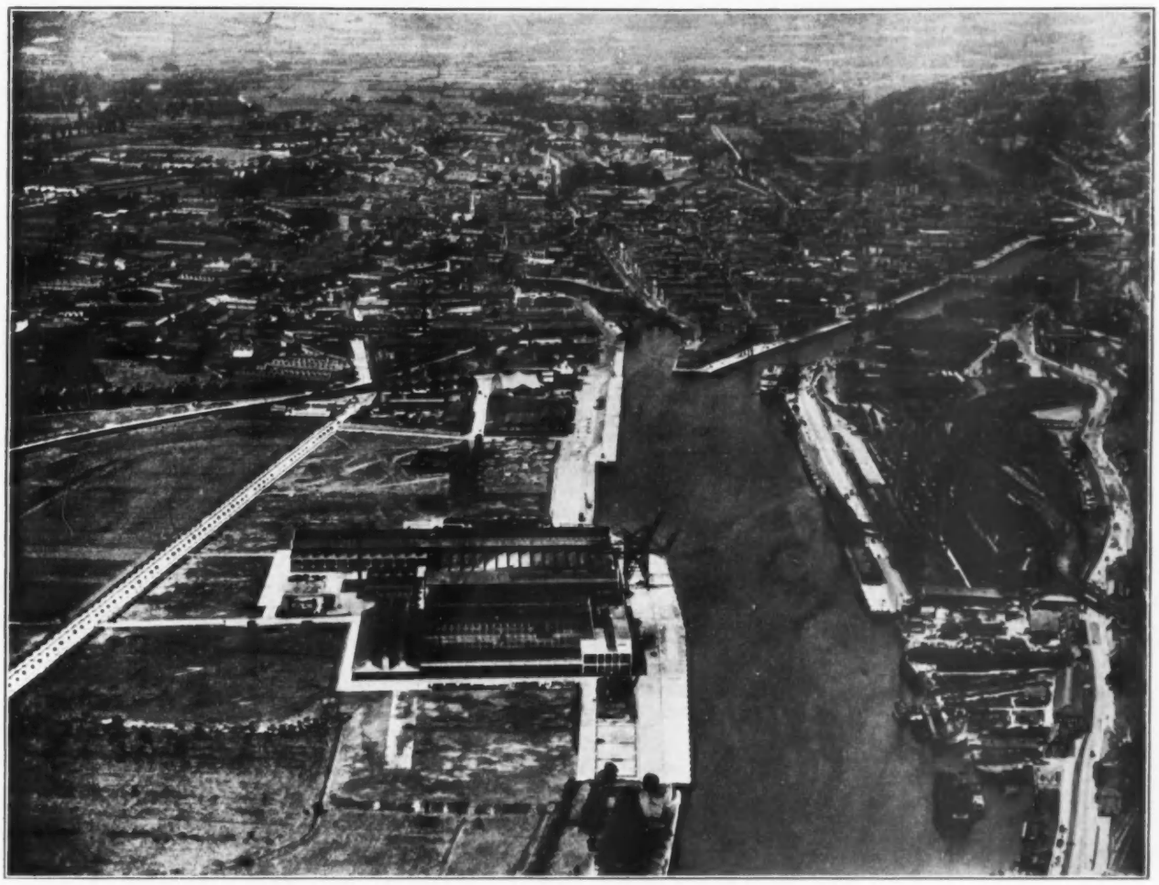
OUR AUTHORITY, AUGUST, 1935.



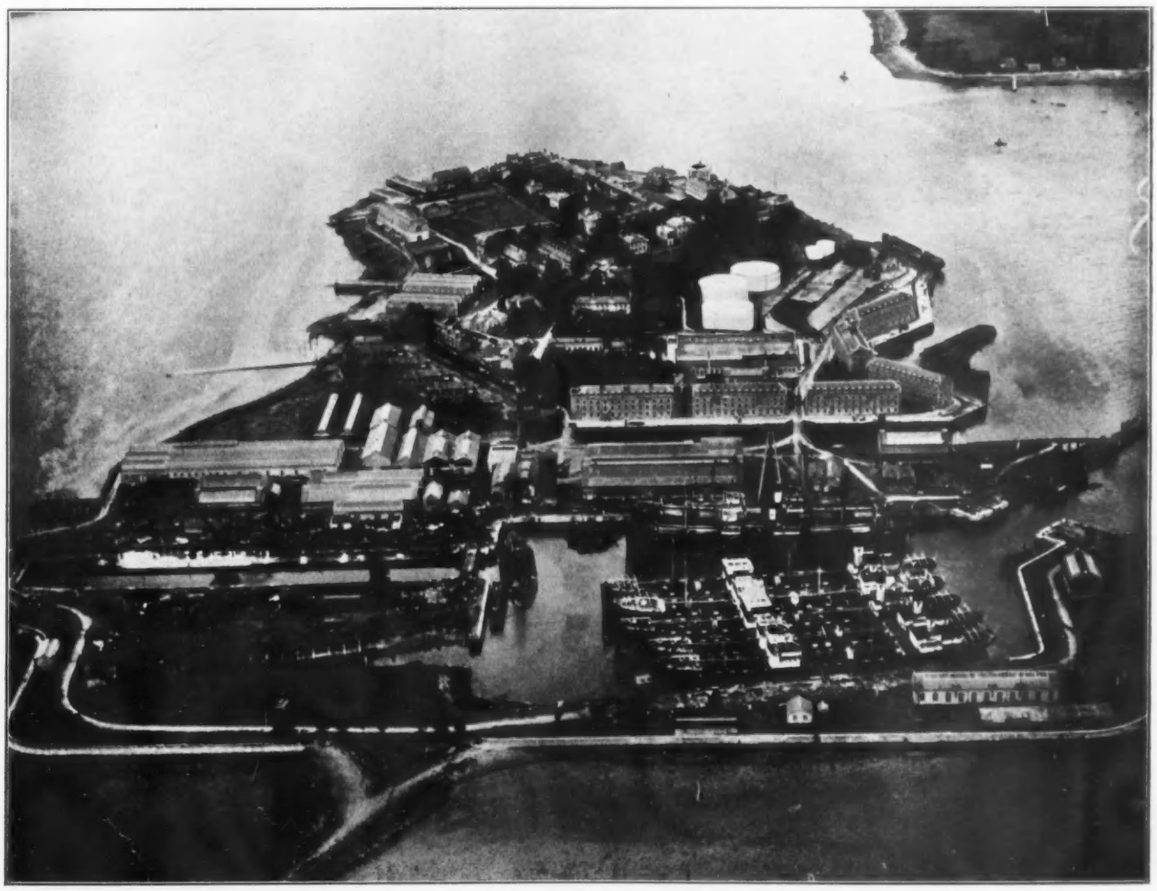


W, LITHO. HANOVER ST. MARYLEBONE, W.

The Port of Cork



Photo] *South Jetties with the Ford and Dunlop Factories in the foreground.* [Aerofilms, Ltd.



Photo] *Haulbowline Island, Cork Harbour, with Basin and Graving Dock in foreground.* [Aerofilms, Ltd.

Hull and the East Coast

Completion of Trent Falls Improvement Works.

THE completion of the Trent Falls Improvement Works in the Upper Humber was formally reported to the most recent meeting of the Humber Conservancy Commissioners by Mr. Arthur E. Butterfield, the engineer to the Conservancy. The training walls at the confluence of the Ouse and Trent, he reported, had been constructed to their full height, and completely rivetted with stone and slag, and thus the work has qualified for the sum of £40,000 promised (additional to £76,000 already paid) by the Conservancy Board towards the cost, charges and expenses incurred by the Aire and Calder Navigation in the Humber, apart from the extensive improvements undertaken by the Navigation in their own territory. The total cost of this particular work, known as the "fishtail," has been £189,000. The Board have authorised the Finance Committee to make provision for the handing over of the additional sum now due.

Subsequently an official inspection of the works was made on the invitation of the Aire and Calder Navigation, the guests including the members of the Humber Conservancy Board, brethren of the Hull Trinity House and others. The works consist of two lengths of training wall; that in the Humber extending 725 yds. beyond the existing Ouse walls, and the Trent wall 2,203 yds. in length.

These walls are constructed of chalk with a covering of hard limestone or slag approximately 2 ft. in thickness. The guide piles for the walls are from 55 ft. to 60 ft. in length, and are placed at 75 ft. centres. In all, 514,000 tons of stone has been used upon the construction of the walls, the chalk stone coming from South Ferriby, the limestone from Warnsworth and the slag from Lincolnshire Iron Works.

Lord Deramore, Chairman of the Aire and Calder Navigation, and the Lower Ouse Improvement Committee presided at the luncheon, and in proposing "The Humber Conservancy Board," paid a tribute to the admirable way in which that body had exercised its extensive powers which, he said, had been fully justified equally by the efficient and impartial manner the various interests had been served. The Humber, he went on, was a classic example of how an estuary could influence the history of a country. Looking at a map of England, the most striking thing upon it was the way the Ouse and Trent, which carried between them the drainage of one-fifth the area of England, might have been specially designed to make Yorkshire and the innermost heart of the Midlands peretrable to commerce and travel. The value of the Humber to us as a nation that lived largely through overseas trade, as a means besides commerce, of offence and defence, could not be overestimated. His Lordship closed his remarks by saying that the training walls would stand for all time as a monument to the co-operative effort of the Humber Conservancy Board and of his own authority, the Aire and Calder Navigation.

In his reply, Mr. J. H. Fisher, J.P., Chairman of the Humber Conservancy Commissioners, gave an interesting explanation as to why his Board do not look with favour on the comprehensive scheme prepared many years ago by eminent engineers for training walls in the Humber above Hull. Having pointed out that a special clause in the Aire and Calder Navigation made it specifically clear that the Humber Conservancy Board were in no way bound to any further recommendations, Mr. Fisher said that his objection and the Conservancy Board's objection to these further recommendations was that no man breathing could say the possible effect of constructing such training walls. It was the life of the Port of Hull that the current and deep-water channel should continue to exist as at present, and that directly one started to interfere with the course or guiding of the river by training walls higher up, who could say where those training walls were going to finish? Mr. Fisher, referring to the contribution of £116,000 towards the cost of the Trent Falls Scheme, said that the Conservancy Board had looked at the matter in a generous spirit, and added that the bulk of the Board's revenue came from Hull, Grimsby and Immingham. If Goole had had to trust to the amount of dues that port could have charged on shipping he did not think the new training walls would have been in existence.

With regard to the equipment at the new works, it may be added that the lighthouse at the apex is supplied by electricity generated at Blacktoft and conveyed by an overhead cable for approximately 8,976 ft. The light is triple flashing, giving flashes of 0.5 (point five) seconds duration with two one-second intervals and 6½ seconds dark period. An acetylene standby is provided in case of failure. There is also a diaphone fog signal giving a blast of 1¾ seconds with a silence of 10¼ seconds, i.e., a single blast every 12 seconds. Should the diaphone fail, a change-over switch is provided to bring a stand-by siren into operation. The scheme also provides for the installation on the Trent training wall of two acetylene lights, viz., a single flashing light with two seconds' light and six seconds' eclipse and a quick-flashing light, giving 60 flashes a minute.

Condition of the River Humber in vicinity of Trent Falls.

Special attention is being paid by the Humber Conservancy Commissioners to the condition of the River Humber in the vicinity of the new works in the upper part at Trent Falls. The Board's Engineer (Mr. A. E. Butterfield), in his latest report, states that in regard to the River Ouse the area of water below L.W.O.S.T. (low water ordinary spring tide) between Blacktoft Pier and the Eastern end of the training wall is 146 acres, as compared with 172 acres in May, 1928. This, he states, is due to the eastern extension of the Blacktoft Sand and the enlargement of Faxfleet Ness. The area of the average cross sections below low-water mark is approximately the same as in 1928, being 7,511 sq. ft., as compared with 7,719 sq. ft. The governing depth is the same as in 1928, viz., 8 ft. below L.W.O.S.T., but the average depth below the same datum has increased approximately 23 per cent. The average width of the low-water channel as would be expected by the construction of the river is 900 ft., as against 1,100 ft. in 1928, the narrowest part of the channel being at the apex of the new works where it is 700 ft.

The Blacktoft Sand has accreted to above the level of the training wall for the whole area, with the exception of a portion close to the northern part of the Trent training wall, where there is a pool of about 200 ft. wide which, now that the Trent training wall has been completed, is rapidly warping up.

Referring to the River Trent, Mr. Butterfield reports that the area of water below L.W.O.S.T. abreast of the new training wall is 138 acres, compared with 146 acres in May, 1928. The area of the average section of this portion of the river below L.W.O.S.T. is 7,145 sq. ft., as compared with 5,895 sq. ft. in May, 1928. Between the apex of the walls and Bosom Cross there is a governing depth of 11 ft. below L.W.O.S.T., but unfortunately it is not maintained as the governing depth between the channel round the training wall and the ebb channel, and the East side of the River Trent is only 3 ft. The minimum width of the low-water channel is 530 ft. As stated in the Engineer's report of January last, the configuration of the river bed is much more even, the greatest depth at Trent Ness being only 26 ft. Mr. Butterfield adds that the flood now appears to have greater influence in the vicinity of the outlet from Adlingfleet drain, the depths having increased considerably since his previous report. The Spit still exists, and there is, he thinks, every possibility of this becoming a prominent feature, probably as an island sand. Regarding the Upper Humber from the apex to West Jetty, Walker Dyke, Mr. Butterfield states that the area of water below L.W.O.S.T. is now 167 acres, compared with 194 acres in May, 1928. The average cross-section of the Humber below L.W.O.S.T. shows a considerable increase, being 12,540 sq. ft., against 9,690 sq. ft. in May, 1928, whilst the governing depth at L.W.O.S.T. has increased from 4 ft. to 6 ft.

Transfer of Property of Scarborough Harbour Commissioners.

The scheme for the transfer of the property of the Scarborough Harbour Commissioners to the Scarborough Corporation has been advanced a stage further, the Provisional Order Bill having been approved and sent for third reading by the House of Commons Select Committee on Unopposed Bills, presided over by Capt. R. C. Bourne, M.P. Mr. Erskine, of the Ministry of Transport, stated to the Committee that under existing powers the Harbour Commissioners had borrowed considerable sums of money from the Scarborough Corporation, but owing to the way in which trade had declined they were unable to repay the principal or the interest on these loans. The Corporation, however, did not want to appoint a receiver; neither did they want to take over the management of the harbour. They had arranged that the constitution of the Commissioners should be increased so that eventually the Corporation would be given a majority. By that means the Commissioners, he said, would be relieved of their debt. The Order further provides that the Commissioners shall not borrow any more money without the permission of the Corporation.

Reconstruction and Extension of Pier at New Holland.

In connection with the improvements in the ferry service between Hull and the opposite bank of the River Humber the London and North-Eastern Railway have placed the contract for the reconstruction and extension of the pier at New Holland with the Yorkshire Hennebique Co., Ltd., Leeds. It is stated that the amount is approximately £29,000 The Hennebique Company specialise in reinforced concrete work. It is expected a beginning will be made shortly and that the contract will be completed in about twelve months.

Engraving 1827
1884-
1935
T.C. & D.C. Ltd
Established 1884.
Tilbury Contracting & Dredging Co. Ltd
Tilbury House, Petty France, Westminster, London, S.W.1
Telephones:— Victoria 2271-2272-2273.
City Office: 50, MARK LANE, E.C.3
Barge Building and Repair Works:
DREADNOUGHT WHARF, S.E.10

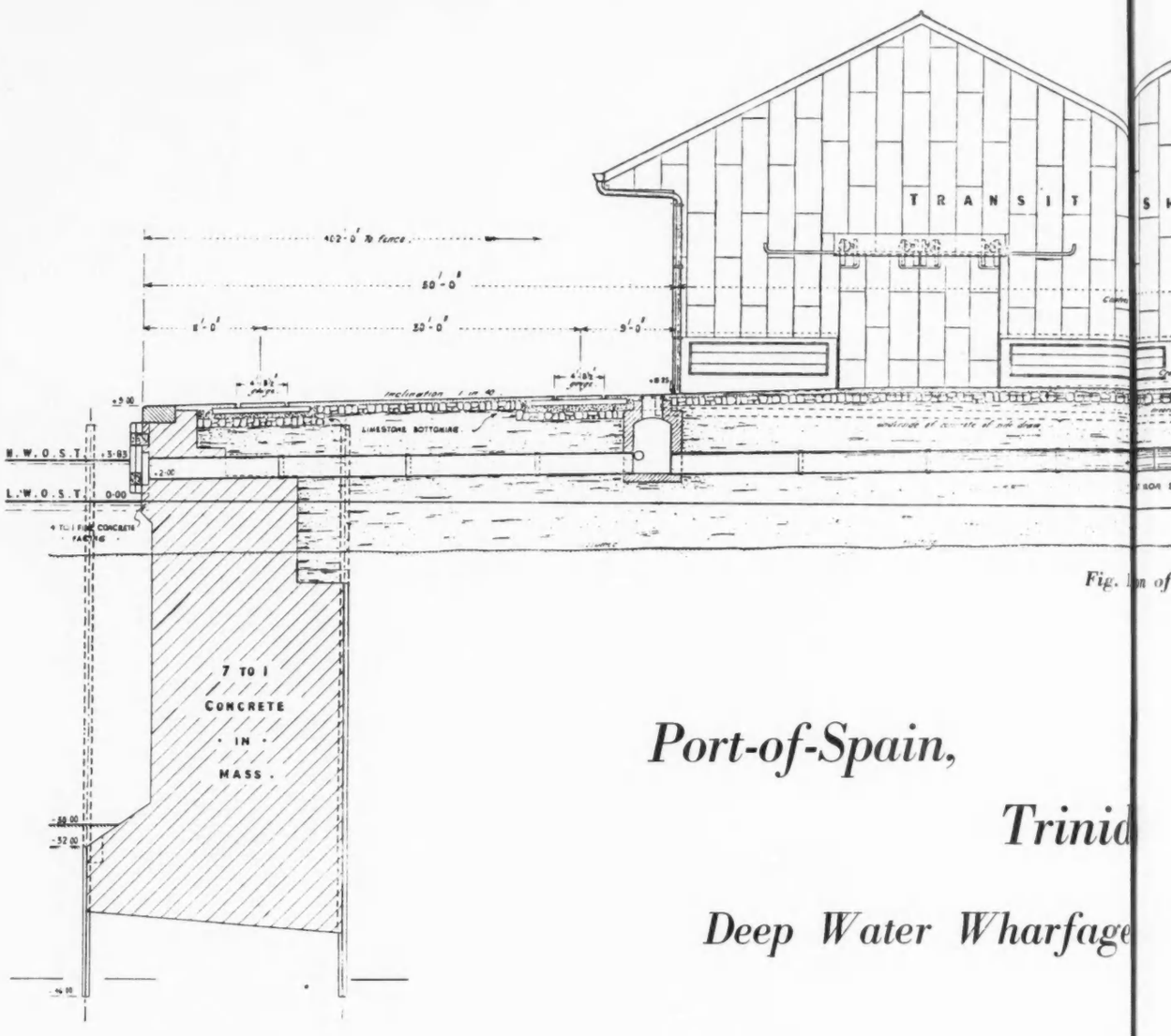


Fig. 1—Plan of

Port-of-Spain, Trinid

Deep Water Wharfage

PORT-OF-SPAIN is situated on the western side of the island of Trinidad in the north-east angle of the Gulf of Paria facing the Venezuelan Coast on the mainland. The Gulf is some 70 miles in length and 30 miles in breadth, the longest exposure of the anchorage off Port-of Spain being about 75 miles in a west-south-west direction. The prevailing winds are off-shore, but sudden squalls occur in the summer months from the south-east round to west. The range of spring tides is 3 ft. 9 ins. and the tidal currents in the vicinity are weak, seldom exceeding one knot. The sea bed is generally composed of a mixture of mud and sand overlying clay.

The anchorage for ocean-going vessels is three miles out, and traffic between ship and shore has hitherto been conducted by lighterage with all the disadvantages attendant on this system of transport. Under the favourable conditions of shelter at this site, however, work in the roads has never been entirely stopped by sea disturbance.

On completion of the works now under construction, ocean-going vessels will be enabled to lie alongside for the discharge and loading of passengers and cargo. These works, as shown on Fig. No. 1, comprise the construction of a wharf wall 3,100 ft. in length, designed to permit an ultimate depth alongside of 32 ft. below low water but with a depth of only 30 ft. in the first instance; the dredging of an approach channel and basin to 30 ft. below low water; the formation of a reclaimed area of 140 acres behind the wharf wall; the erection of five ground-floor transit sheds; the provision of rail and road tracks; and the installation of electric light, water mains, etc.

The wharf wall is of mass concrete deposited in the dry between two rows of inter-locking steel sheet-piling, as shown on Fig. No. 2. The dredged approach channel is to have a bottom width of 350 ft., and will be marked with beacons. The dredging of this approach channel and the basin in front of the wharf wall involve the removal of over six million cubic yards of material, about 2½ million cubic yards of which will be deposited in the reclaimed area at the back of the wharf wall, the remainder being dumped at sea in deep water. The transit sheds are each 405 ft. in length by 90 ft. in width, of steel covered with steel corrugated sheeting. There will be two railway tracks in front, and two at the back of the sheds connected with the Government Railway system.

The combined inward and outward traffic at Port-of-Spain is approximately 300,000 tons per annum, the chief exports being sugar and cocoa. Should this traffic show signs of any appreciable increase, the wharfage can be conveniently and economically extended.

A contract for the works was let to Messrs. Edmund Nuttall, Sons and Company, and John Mowlem and Company (Joint) Limited, at the end of 1934, the completion date being towards the end of 1938. The work is being carried out under the general direction of the Crown Agents for the Colonies to the designs, and under the supervision of Messrs. Coode, Wilson, Mitchell, and Vaughan-Lee, of Westminster.

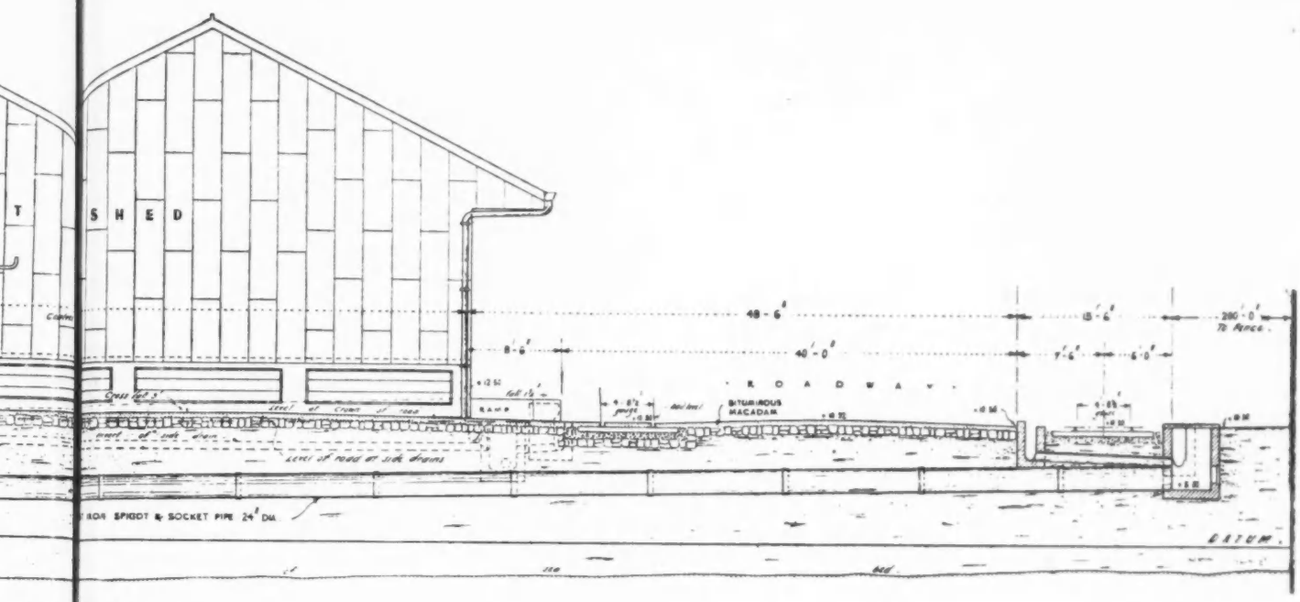


Fig. [illegible] of Wharf.

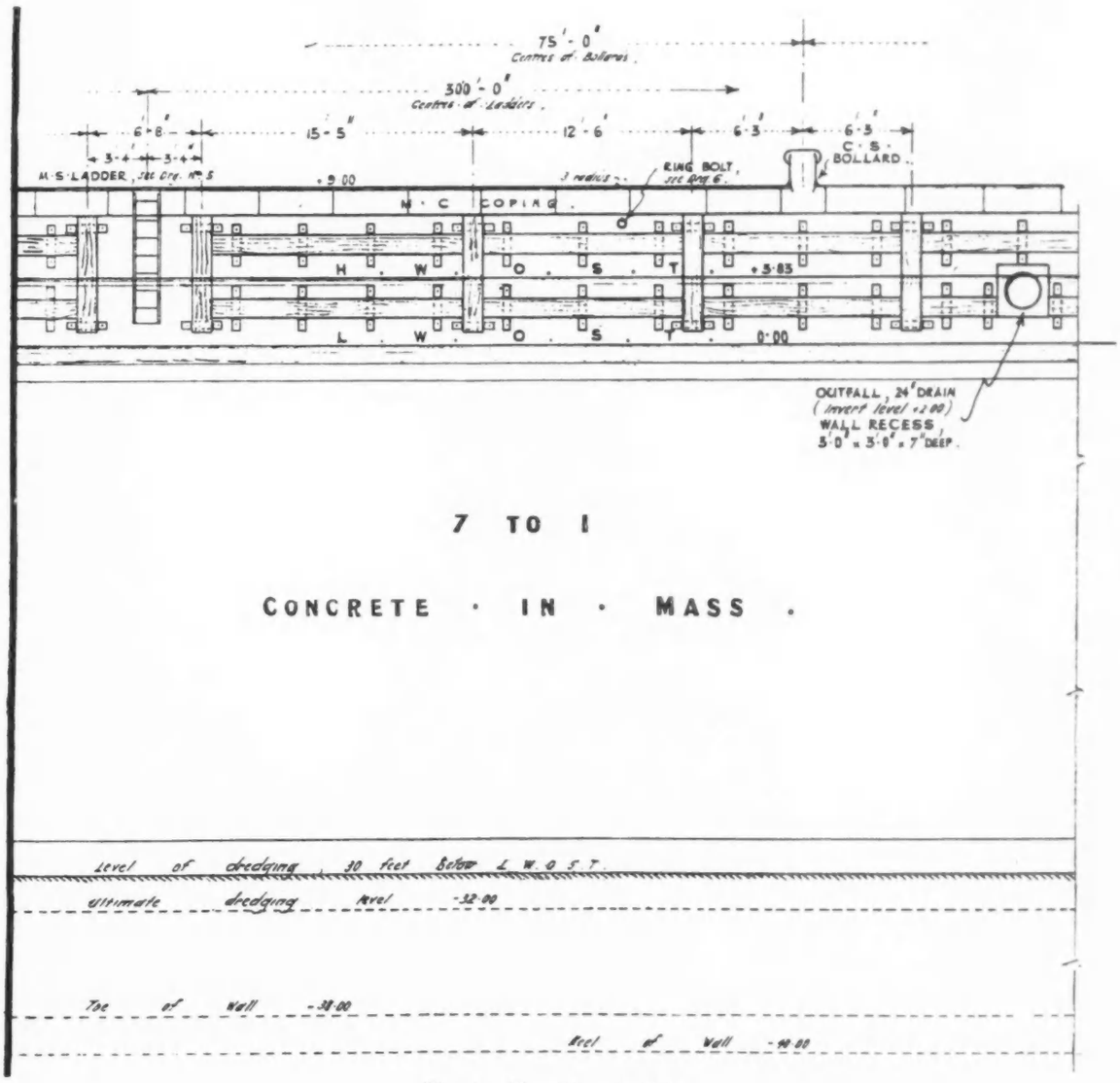


Fig. 2. Elevation of Wall.

Port-of-Spain, Trinidad

Deep Water Wharfage

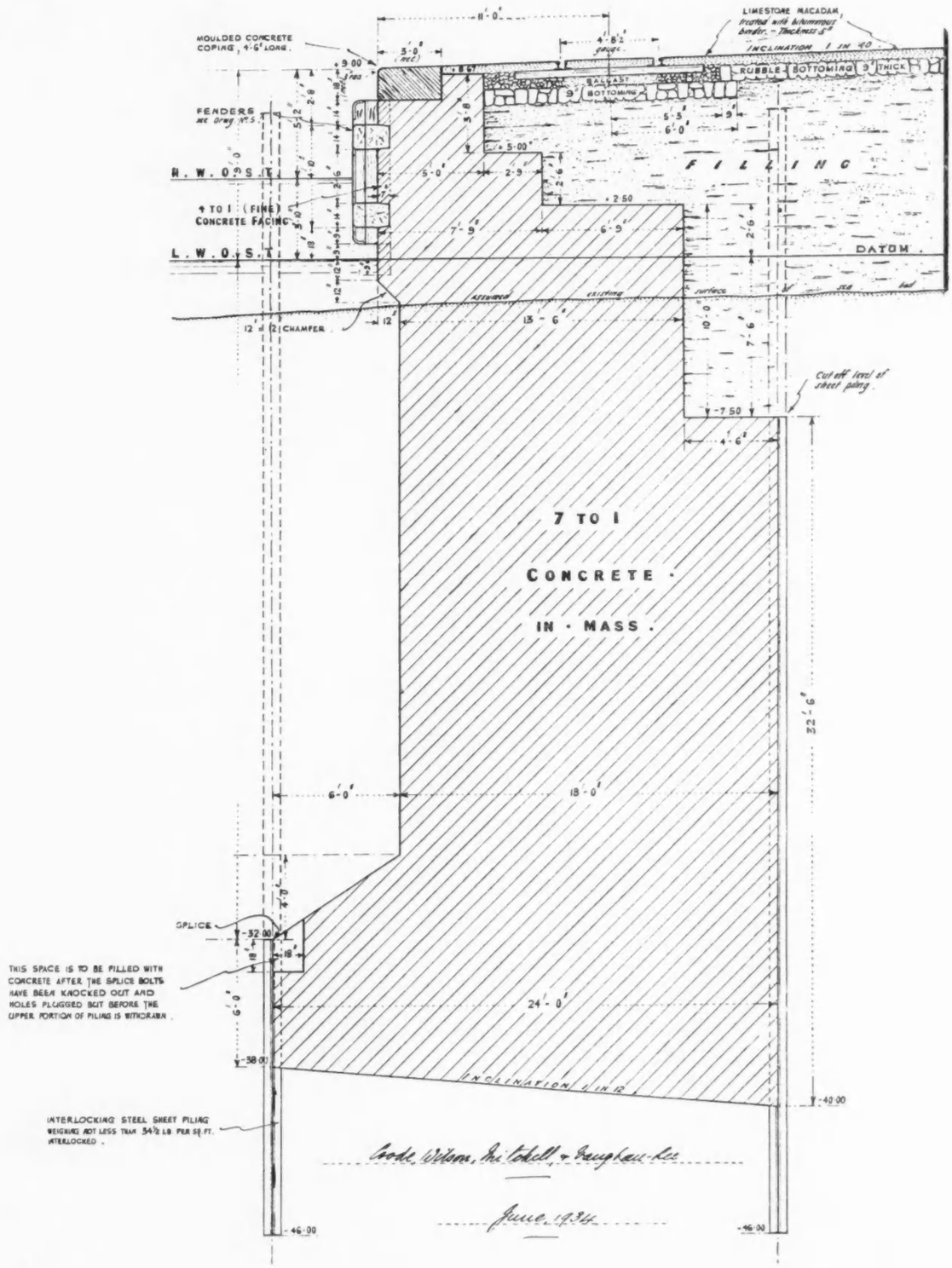

MOULDED CONCRETE COPING, 4'-6" LONG.
FENDERS
H.W.O.S.T.
4 TO 1 (FINE) CONCRETE FACING
L.W.O.S.T.
LIMESTONE MACADAM, treated with bituminous binder. - Thickness 6"
INCLINATION 1 IN 40
RUBBLE BOTTOMING 9" THICK
BALLAST BOTTOMING
FILLING
DATUM.
assumed
existing
surface
12" x 12" CHAMFER
Cut off level of sheet piling.
7 TO 1
CONCRETE
IN MASS.
SPLICE
THIS SPACE IS TO BE FILLED WITH CONCRETE AFTER THE SPLICE BOLTS HAVE BEEN KNOCKED OUT AND HOLES PLUGGED BUT BEFORE THE UPPER PORTION OF PILING IS WITHDRAWN.
INTERLOCKING STEEL SHEET PILING WEIGHING NOT LESS THAN 54½ LB. PER SQ. FT. INTERLOCKED.
INCLINATION LINE
Coode, Wilson, Mitchell & Vaughan-Lee
June, 1934.

Fig. 3. Typical Section of Wall.

TRINIDAD. — PORT-OF-SPAIN. —

THE PROPOSED WORKS ARE SHEWN BY RED COLOUR.

REFERENCES

LEADING LIGHTS ARE SHOWN THUS :-

BEACONS (*black tonn = 3·00*) ..... :-

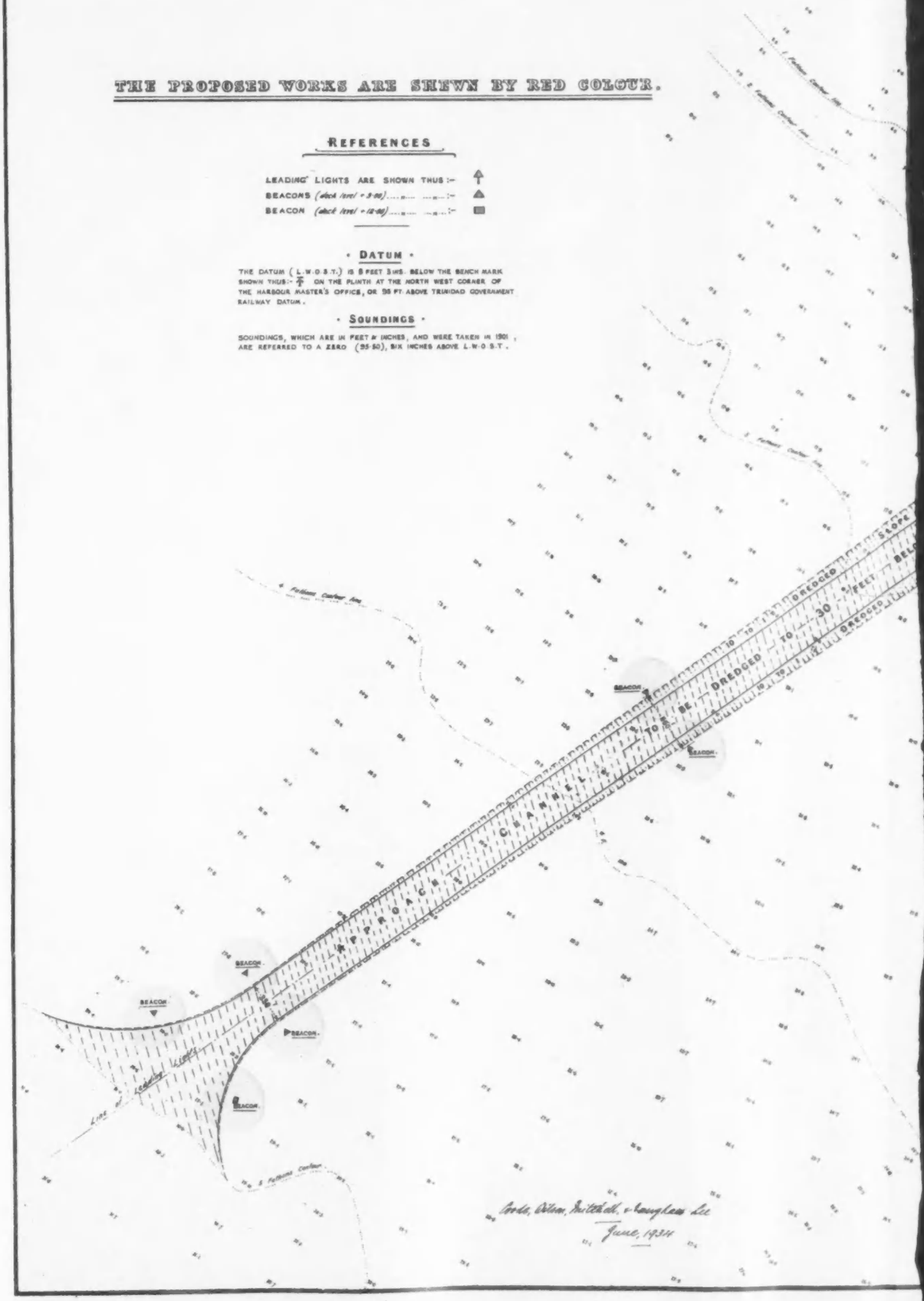
BEACON (*black tonn = 12·00*) ..... :-

· DATUM ·

THE DATUM (L.W.O.S.T.) IS 8 FEET 3 INS. BELOW THE BENCH MARK SHOWN THUS :- ⊤ ON THE PLINTH AT THE NORTH WEST CORNER OF THE HARBOUR MASTER'S OFFICE, OR 98 FT. ABOVE TRINIDAD GOVERNMENT RAILWAY DATUM.

· SOUNDINGS ·

SOUNDINGS, WHICH ARE IN FEET & INCHES, AND WERE TAKEN IN 1901, ARE REFERRED TO A ZERO (25·50), SIX INCHES ABOVE L.W.O.S.T.



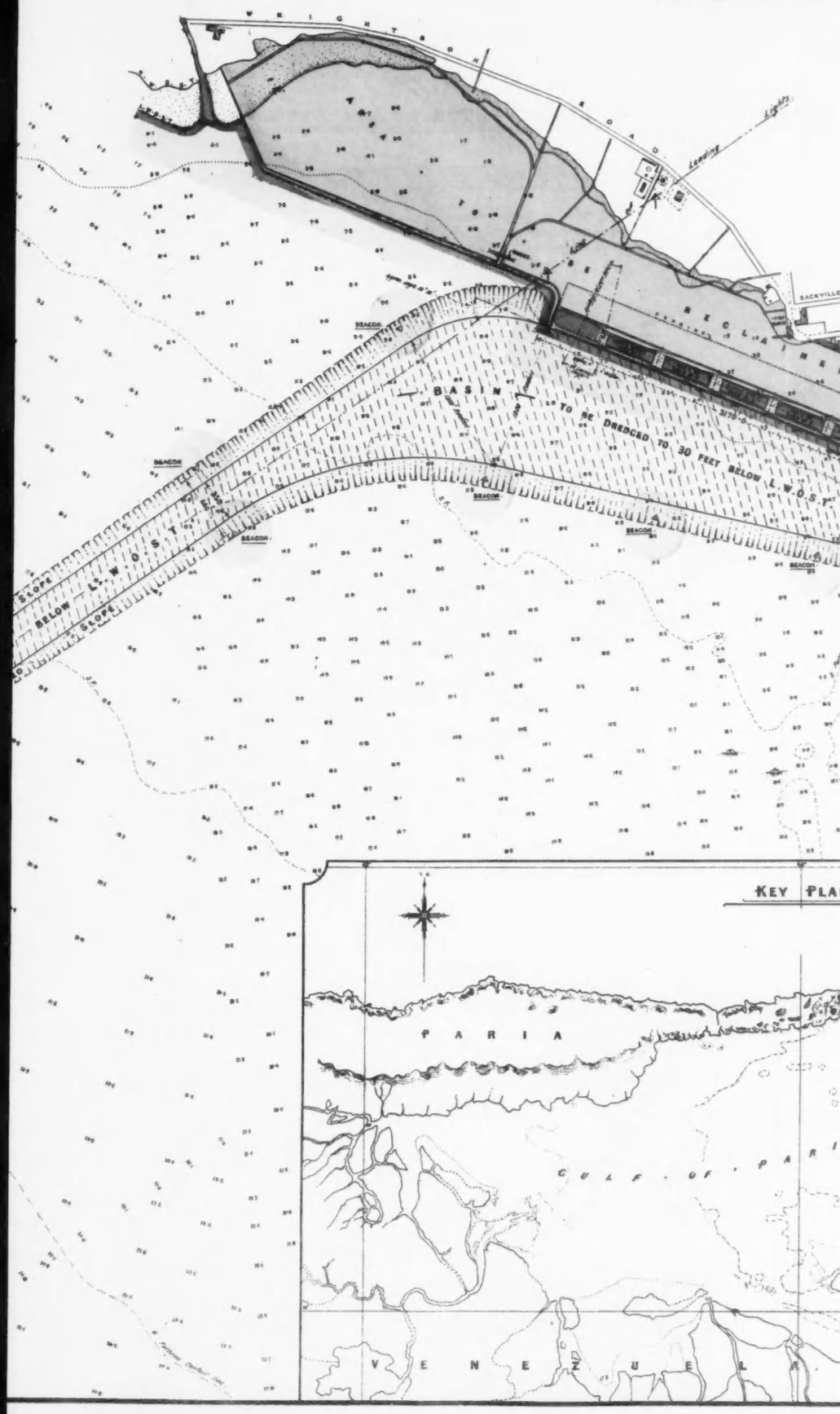
Cooke, Ritson, Mitchell, & Langlees Lee

June, 1911

HARBOUR AUTHORITY, AUGUST, 1935.

DEEP WATER WHARFAGE. —— SITE P

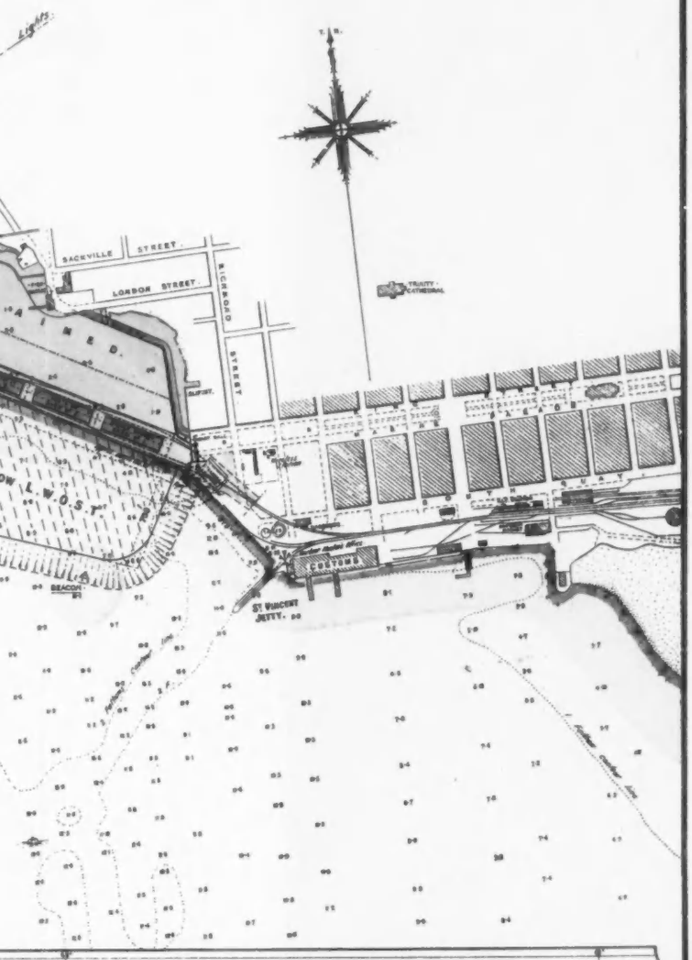
SHOWING EXTENT



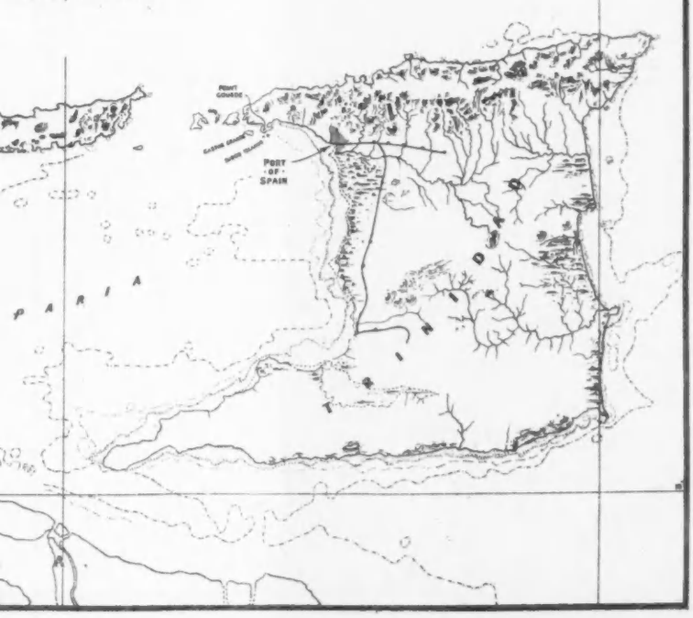
WARD & FOXLOW, LITHO. HARCOURT ST. MARYLEBONE, W.

TE PLAN

EXTENT OF WORKS



KEY PLAN



North-East Coast Notes

Less Idle Tonnage.

NO sign of improvement in trade and industry on the North-East Coast is more pleasing than the steady diminution in the amount of idle tonnage. There are still too many idle vessels, but the figures are gradually reaching more reasonable dimensions, and in the second week of July the number of vessels was down to 57 of a total of 117,862 net register tons. When one compares this with the "peak" period figures of 180 vessels of 391,000 tons, it becomes very obvious that a vast improvement has been effected. All the vessels removed have not gone into home commission, for some have been sold to foreign owners and others have been scrapped, but at least the waterway is assuming something of a normal appearance.

Hitch in Tyne Developments.

It would seem at the moment as though the negotiations between the Tyne Improvement Commission and the London and North-Eastern Railway Company regarding the acquisition by the former of Tyne Dock, which is the property of the Railway Company, had reached a deadlock. The report of a special committee of the Commission in regard to the matter was presented at a meeting of the Commission at the latter part of June by the Chairman, Mr. H. P. Everett. Mr. Everett said that members would remember that at the April meeting he went very fully over the ground of the negotiations between the Railway Company and the Commissioners on a recommendation which the special committee then made to offer the Railway Company £450,000 for the dock. That offer was made in response to the Railway Company's intimation that they were prepared to dispose of the dock to the Commission for £650,000. The Railway Company replied that they could not see their way to accept the Commissioner's offer, and that the Company's offer to sell the dock for £650,000 was withdrawn. That, said Mr. Everett, would appear to be the end of the negotiations at any rate at present. The special committee was not making any recommendation, except that the negotiations with the Railway Company be brought to the notice of the Royal Commission appointed to consider the question of local government on Tyneside. It would be remembered that Mr. Malcolm Stewart, the Commissioner for the Special Areas, had offered a grant up to £275,000 towards a scheme for a deep-water quay subject to arrangements being made regarding the use of Tyne Dock. Mr. Everett said he was sorry to lose the money, but at the same time he would rather lose the money than spend something they thought they were not justified in doing.

New Coal Staiths.

The Lord Mayor of Newcastle, at the June meeting of the Tyne Commission, remarked on the excellent progress which was being made with the construction of the new coal staiths at the boundary between Jarrow and Hebburn. The contractors, he believed, were well up to time. The latest progress report submitted to the Docks and Trade Committee of the Tyne Commission stated that the site of the concrete motor road had been ashed and rolled, and about 8 per cent. of the concrete surface laid. The drainage work was about 75 per cent. completed. About 80 per cent. of the 4-inch diameter water main had been laid. Half of the 416 timber piles had been driven. About 330 lin. ft. of slag pitching, about 17 ft. wide, had been laid on the sloping river wall out of a total of 1,004 lin. ft. About 80 per cent. of the excavation for the full lines had been done, and the embankment for empty sidings had been formed. The construction of the electric sub-station had been commenced.

It is understood that the Tyne Improvement Commission has decided to rejoin the Dock and Harbour Authorities' Association, of which it was a member years ago, but out of which it dropped. A re-grouping of the authorities is understood to be under consideration, and the North-East Coast may be divided and comprise Berwick, Blyth and Tyne in one section and other East Coast ports in another section.

An instance of smart loading at the London and North-Eastern Railway Company's Dunston staiths was announced in the early days of July. The steamer "Seva Jarl" started loading at 5.20 a.m., and finished at 5.10 next morning, having taken on board 6,053 tons of Towneley unscreened steam coal.

North-East Coast Coal Exporters' Views.

At the invitation of the Tyne Improvement Commissioners, members of the North-East Coal Exporters' Association made an inspection of the Tyne port on the 5th July. Welcoming the Association members at lurch on the Commissioners' launch, Mr. H. P. Everett, the Commissioners' chairman, said despite the poverty on the river, there were still matters for congratulation. They knew what the Commission was doing to improve the facilities for shipping and to provide for wharves. The enterprise of the Newcastle Corporation was also to be commended, and they had also had great help from the various corporations on the river, and the Commissioners' relations with them were very cordial. Colonel Arnold Irwin (chairman of the Association) congratulated the Commissioners on their propaganda for the Tyne. This had brought the river to the notice of a large number of oversea customers, and proved to them the high standard of efficiency which the Commissioners had achieved in the transport and handling of goods on the river. "As exporters," Colonel Irwin added, "we still want to see more careful handling of fuel. The Commissioners are doing their bit, but I think you will agree that the London and North-Eastern Railway Company might do more. I think we can predict that in the not too far distant future there will be a greater shipment of coke from this river than in the past owing to the increasing number of ovens. If Durham coke is to enhance its reputation and widen its market I think still greater care will have to be taken in the handling of it."

Figures about Local Trade.

At the meeting of the Tyne Commission at the latter part of June the Docks and Trade Committee reported that the coal and coke shipments for the past five months amounted to 5,600,513 tons, or 340,547 tons less than in the corresponding period of last year. The Lord Mayor of Newcastle (Mr. R. S. Dalgliesh) said the returns were still far below what they would like. The rate of decrease, however, seemed to have been arrested, for the returns for May only showed a decrease of 42,262 tons, the smallest of any month this year. A satisfactory feature of the export trade was that slightly more coal went to Italy than last year, in spite of restrictions and an apparent tendency for Italy to take more Polish coal. Exports to Scandinavian countries had improved, but the figures for France, Holland, and Belgium were still very discouraging.

There is a rather better tendency in the trade figures for the Wear. Although the coal and coke shipments for the first five months of the year were 81,544 tons down at 1,630,923 tons, the May total at 346,188 tons was only 226 tons below that for the same month of 1934. Other exports totalled 18,689 tons for the five months, against 21,866 tons for the like period in 1934. Imports were considerably up, the total being 122,917 tons for the five months, compared with 110,419 tons for the same period last year. The main increases shown in this return were in respect of timber and iron ore.

At the June meeting of Blyth Harbour Commission, Mr. R. M. Sutton, deputy-chairman, reported that coal shipments for the five months of the year totalled 2,579,627 tons, compared with 2,631,275 tons last year, and 2,251,241 tons in 1929. The totals show a decrease of 2 per cent. on 1934, and an increase of 15 per cent. on 1929.

Weser Shipping in the First Quarter of 1935

During the first quarter of the current year water conditions on the Weser were more favourable than in the same period of the previous year. The first quarter of 1935 was also more favourable than the same period of 1933 and 1932.

Goods traffic through the Bremen Weser Lock in March, at 158,400 tons in both directions, was 23,600 tons, or 18 per cent. larger than in February, and 11,500 tons, or 8 per cent., more than in March, 1934. During the first quarter of 1935, altogether 437,000 tons passed through the lock, against 399,300 tons in the same period of the previous year, that is, 37,700 tons, or almost 10 per cent., more. Down-stream at 308,000 tons, 13,100 tons, or 4½ per cent. more, arrived, up-stream at 129,000 tons, 24,600 tons, or 24 per cent. more. Development of the various most important goods, compared with the previous year, was as follows: in down-stream traffic potash salts doubled (plus 42,000 tons); gravel and stones increased by 55 per cent. (plus 34,600 tons); on the other hand, arrivals of Rhenish-Westphalian coals shrank from 131,700 tons in the previous year to 89,900 tons, as a result of the excessive canal dues for bunker coals. This is a decrease of 41,800 tons, or 31 per cent. In this connection it may be mentioned that the quantities of coals carried in the first quarter of 1928 amounted to 276,000 tons.

Finally, transport of inland grain, which amounted to more than 19,000 tons in the previous year, has ceased. The commencement of mineral oil shipments up-stream was the chief reason for the increase. Grain, flour, scrap and rice also increased, while piece-goods decreased and pyrites and phosphate transports ceased altogether.

The Port of Colombo

Dredging.

DURING the month of May, 1935, the dredger "Sir William Matthews" was engaged in dredging alongside the S.W. Breakwater from approximately midway of Berth 4 N.E. to midway of Berth 3 N.E.

A total quantity of 29,250 cu. yds. of dredged material consisting mainly of mud and fine silt and some sand close in to the breakwater, was removed and deposited at sea during the month.

Vessels passing through the Lake to Harbour Canal.

The number of lighters, motor launches, steam launches, jolly boats, barges and punts, sailing boats, water boats, and rafts which passed through the Lake to Harbour Canal in May, 1935, was 689, as compared with 1,016 in May, 1934. The total number of vessels which passed through the Lake to Harbour Canal in the first five months of 1935 was 3,183, as compared with 4,572 for the corresponding period of 1934.

Goods Traffic through the Lake to Harbour Canal.

The goods traffic through the Lake to Harbour Canal during May, 1935, amounted to 789 tons of imports and 4,278 tons of exports, as compared with 1,039 tons of imports and 8,120 tons of exports in May, 1934. For the first five months of 1935, 4,998 tons of imports and 19,973 tons of exports passed through the Lake to Harbour Canal, as compared with 11,006 tons of imports and 33,180 tons of exports for the corresponding period of 1934.

Liquid Fuel Imports.

The quantity of liquid fuel imported at Colombo during May, 1935, amounted to 31,525 tons, as compared with 19,175 tons in May, 1934. During the first five months of 1935, 139,651 tons of liquid fuel were imported, as compared with 120,114 tons for the corresponding period of 1934.

Liquid Fuel Bunkers supplied to Steamers.

The quantity of liquid fuel bunkers supplied to steamers in May, 1935, was 42 ships bunkered with 22,880 tons of liquid fuel, as compared with 43 ships with 21,298 tons in May, 1934. For the first five months of 1935 the total number of ships bunkered was 215 with 114,643 tons of liquid fuel, as against 211 ships with 112,088 tons for the corresponding period of 1934.

Coal Imports.

The quantity of coal imported during the month of May, 1935, was 62,284 tons, as compared with 37,116 tons in May, 1934. A total of 192,418 tons of coal was imported for the first five months of 1935, as against 161,292 tons for the corresponding period of 1934.

Coal Bunkers supplied to Steamers.

The number of steamers bunkered during May, 1935, was 79, with a total of 27,096 tons of coal, as compared with 55 steamers with 19,248 tons of coal in May, 1934. For the first five months of 1935, 378 steamers were bunkered with 111,564 tons of coal, as compared with 329 steamers with 92,150 tons of coal for the corresponding period of 1934.

Number and Tonnage of Vessels Entered and Cleared.

The number and tonnage of vessels other than country craft engaged in trade which entered and cleared at this port during the periods specified:—

(a) ENTERED:—

	Vessels engaged in Foreign Trade		Vessels engaged in Coasting Trade	
	No.	Tons	No.	Tons
During May, 1935	228	1,065,867	6	18,148
During May, 1934	219	1,022,315	2	6,347
During May, 1933	213	981,451	2	4,389
During the five months ended May, 1935	1,139	5,232,485	19	52,997
During the five months ended May, 1934	1,101	5,089,723	18	53,806
During the five months ended May, 1933	1,061	4,808,243	2	4,389

(b) CLEARED:—

	Vessels engaged in Foreign Trade		Vessels engaged in Coasting Trade	
	No	Tons	No.	Tons
During May, 1935	240	1,104,074	4	13,997
During May, 1934	225	1,031,989	2	7,710
During May, 1933	207	946,602	3	11,295
During the five months ended May, 1935	1,158	5,282,525	10	36,223
During the five months ended May, 1934	1,116	5,118,517	14	50,728
During the five months ended May, 1933	1,052	4,769,923	8	28,135

Tonnage of Imports and Exports.

The tonnage of imports and exports at this port during the periods specified:—

	During May		
	1933 Tons	1934 Tons	1935 Tons
Imports (excluding Coal and Oil) ...	69,478	90,569	97,438
Exports	58,230	67,686	53,202
Total	127,708	158,225	150,640

	During the Five Months ended May		
	1933 Tons	1934 Tons	1935 Tons
Imports (excluding Coal and Oil) ...	343,226	429,044	436,541
Exports	235,286	299,241	227,388
Total	578,512	728,285	663,929

Oil Facilities Receipts.

The oil facilities receipts for May, 1935, were Rs. 65,000, as compared with Rs. 94,869 during May, 1934. The total receipts for the first five months of 1935 amounted to Rs. 459,481, as compared with Rs. 440,131 for the corresponding period of 1934.

The Port of Amsterdam

The position of the Port of Amsterdam in regard to number of vessels and tonnage and to goods traffic arrived and sailed, as compared with corresponding figures of last year, is as follows:—

SEAGOING VESSELS AND TONNAGE.

	ARRIVALS				SAILINGS			
	No.	Per Cent.	N.R.T.	Per Cent.	No.	Per Cent.	N.R.T.	Per Cent.
May 1934 ...	295		387,614		292		406,025	
,, 1935 ...	227		323,429		231		344,130	
	—68	—23·05	—64,185	—16·56	—61	—20·89	—61,895	—15·24
April 1935 ...	232		342,071		224		331,369	
May 1935 ...	227		323,429		231		344,130	
	— 5	—2·16	—18,642	—5·45	+7	+3·13	+12,761	+3·85
Jan.-May 1934	1,337		1,953,272		1,337		1,961,857	
,, 1935	1,198		1,818,612		1,198		1,824,367	
	—139	—10 40	—134,660	—6 89	— 139	—10·40	—137,490	—7·01

SEAGOING GOODS TRAFFIC.

(In Tons of 1000 Kilos*).

	1 Import	2 Transit incl. in col. 1	3 Export	4 Transit incl. in col. 3	5 Total col. 1 & 3
Apr. 1934	267,812	48,196	110,130	45,237	377,942
,, 1935	256,647	60,132	129,279	55,006	385,926
	—11,165	+11,936	+19,149	+9,769	+7,984
	—4·17%	+24·77%	+17·39%	+21·60%	+2·11%
Mar. 1935	279,555	57,906	158,439	67,169	437,994
Apr. 1935	256,647	60,132	129,279	55,006	385,926
	—22,908	+2,226	—29,160	—12,163	—52,068
	—8·19%	+3·84%	—18·40%	—18·11%	—11·89%
Jan.-Apr. 1934 ...	1,203,261	229,813	527,958	201,450	1,731,219
,, 1935 ...	1,128,447	254,762	586,982	248,199	1,715,429
	—74,814	+24,949	+59,024	+46,749	—15,790
	—6·22%	+10·86%	+11·18%	+23·21%	—0·91%

* These figures have been taken from the monthly statistics of the Central Bureau, The Hague, Holland.

Classified according to flag the number of vessels which entered the Port of Amsterdam during May was:—Netherlands, 121; Great Britain, 46; German, 21; Swedish, 14; Norwegian, 10; Danish, 4; American, 1; Greek, 3; Finnish, 1; Italian, 3; Belgian, 2; Russian, 1.

Vessels laid-up at Amsterdam:—1st May, 1935,—13 vessels, measuring 86,978 tons gross; 1st June, 1934,—18 vessels, measuring 88,690 tons gross; 1st June, 1935,—18 vessels, measuring 116,351 tons gross.

Bordeaux Dredgers

The first putting out to Sea of the "Normandie" rendered possible by the Deepening and Widening of the Approach Channel of the Port of St. Nazaire by the Seagoing Suction Dredgers "Pierre Lefort" and "La Coubre" belonging to the Port of Bordeaux.*

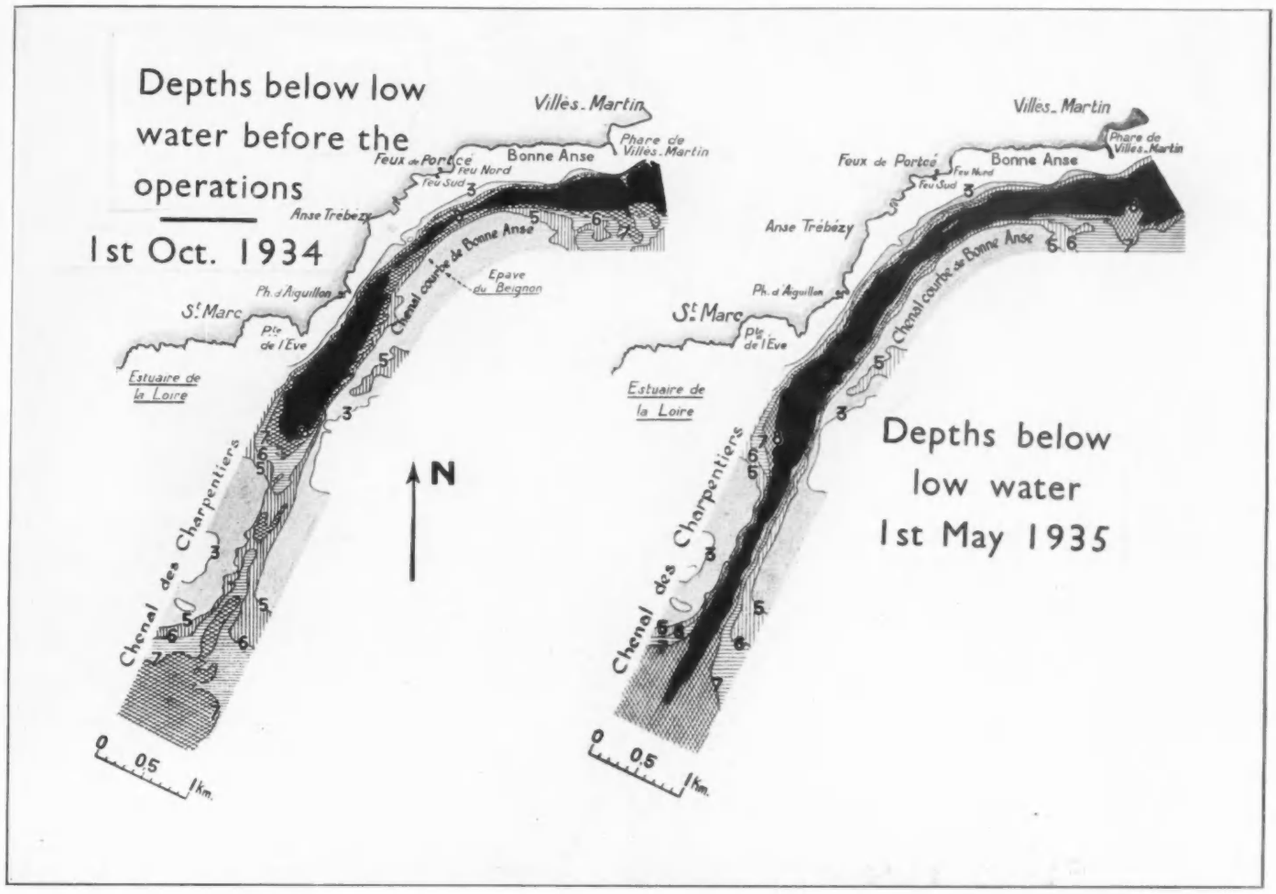
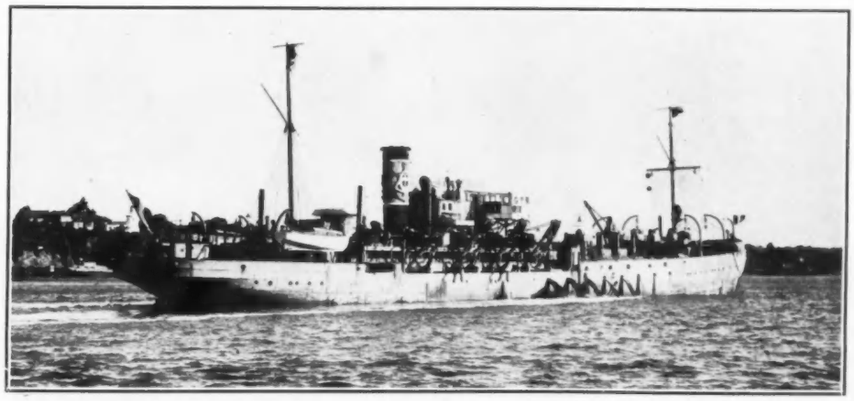


Fig. 1. Comparative diagrams showing the results of Dredging carried out by the Port of Bordeaux Suction Dredgers in the approach Channels of the Port of St. Nazaire.

The Problem of the "Normandie" putting to Sea.

AMONG the many technical problems arising from the building of the liner "Normandie" at St. Nazaire, one of the most interesting to notice is that of enabling the vessel to put out to sea by way of channels in the Loire, which were normally inadequate for the passage of so large a ship. It was therefore necessary to arrange for the improvement of certain sections of these channels, and the works decided upon comprised dredging the straight Charpentiers Channel, 2½ kilometres (1½ miles) long, increasing its depth from 6 to 8 metres (20 to 26 ft.) below zero of charts for a width of 200 metres (656 ft.); also improving the curve of the Bonne Anse Channel, about 1½ kilometres (nearly a mile) long, giving it a radius of 2 kilometres (1¼ miles) and a depth of 8 metres (26 ft.).

These works entailed the removal of about four million cubic metres (over five million cubic yards) and that in a part of the estuary where the sea is often rough. It was necessary, moreover, that the dredged spoil should be deposited at sea, about 10 kilometres (6 miles) from land, to prevent it from being quickly carried back by the currents into the channels again. It was required, further, that this dredging should be done in so short a period that fresh deposits of material should have no time to accumulate before the liner passed out. Finally, the cost of the work had to be kept as low as possible. These were the general features of the problem.



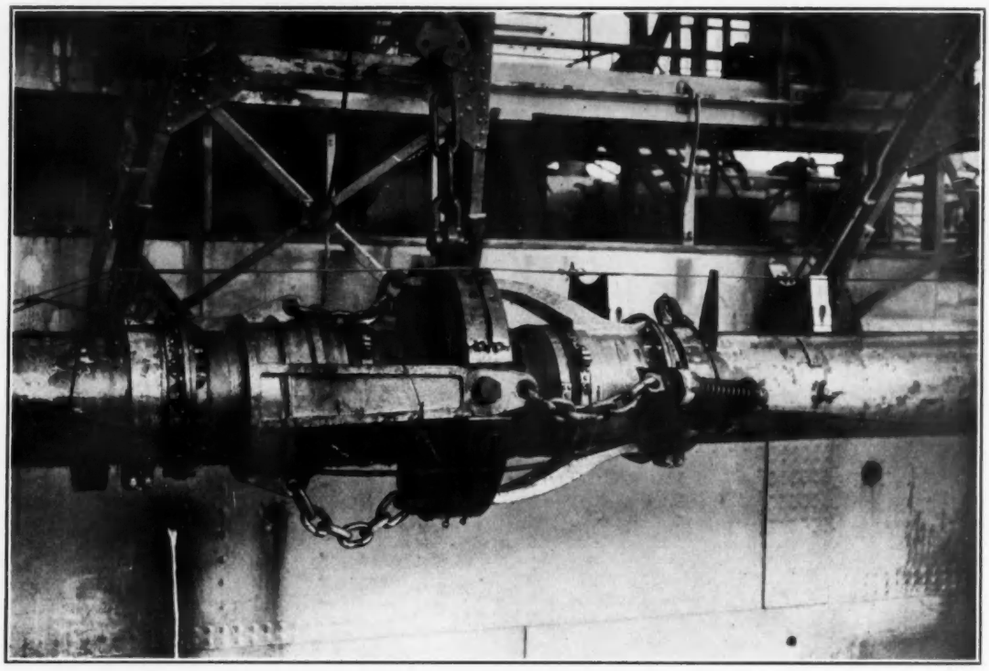
The Suction Dredger "Pierre Lefort" at work in the Entrance Channel of the Port of St. Nazaire.

The Suction Dredgers of the Port of Bordeaux.

A problem of this magnitude could only, at the present time, be dealt with satisfactorily by the two marine suction dredgers belonging to the Port of Bordeaux: the "Pierre Lefort" and "La Coubre." The Director of Seaports therefore decided to enlist the help of the Bordeaux Port Management, which had brought these remarkable machines into being.

*The same dredgers had previously, in 1930-32, deepened the Great West Passage, the main channel entering the Gironde Estuary, and thus enabled large vessels to approach the Port of Bordeaux and its Outport at Le Verdon.

Bordeaux Dredgers—continued



Semi-flexible Pipe Coupling: Port of Bordeaux.

The dredger "Pierre Lefort," the more powerful and more modern of the two, designed entirely by French engineers and built in Germany as an item of Reparations, was specially intended and fitted for dredging while under way and in a rough sea, a problem which had remained until recent years without any satisfactory solution.

The port engineers of Bordeaux had encountered and solved a similar problem, four years before, when they had to cut, through the shallows at the mouth of the Gironde, a new entrance channel, 4½ kilometres (2¾ miles) long, 1 kilometre (⅝ mile) wide and 10 metres (33 ft.) deep below zero of charts. This work necessitated the excavation and the deposit at sea, of 16 million cubic metres of silt (comprising mud, sand and gravel) in a locality where the sea is often stormy and where, to avoid frequent interruption, dredging has to be carried on in a swell reaching an amplitude of 3½ metres (11½ ft.) from trough to crest. The dredgers "Pierre Lefort" and "La Coubre" meet these requirements.

They are both very steady vessels, whose essential characteristic is that they are fitted on either side with large suction tubes trailing aft and so arranged that, while the upper end communicates with the suction pumps, the lower end rests aslant and free upon the bottom to be dredged. In this working position the flexibility of the combination "dredger-and-tubes" is such that operation can continue regularly notwithstanding the rolling and ranging of the dredger on the one hand and the movement of the tube nozzles on the uneven bottom on the other hand. This flexibility is obtained mainly by means of semi-flexible joints, specially designed for the purpose of connecting together the rigid component parts of each tube. On cessation of work, the tubes are lifted and housed on deck on either side of the dredger.

The main features of the "Pierre Lefort" are as follows:—

		Metres	Feet
Length between Perpendiculars	...	102.41	336
Beam	...	16.50	54
Depth Amidships	...	7.95	26
Capacity of Hopper	...	2,000 cube	70,000 cube
Loaded Draft	...	6	20

The machinery consists solely of Diesel motors with electric transmission, comprising two Diesel electric sets to port and starboard, each of 1,400 h.p., for the two propellers, one central set of 1,800 h.p. for the pumps, and various other sets for auxiliary services.

Being thus adapted for continuous duty, so long as the sea is not too rough, the dredgers "Pierre Lefort" and "La Coubre" have removed between them as much as 36,400 cubic metres (48,000 cubic yards) in 24 hours.

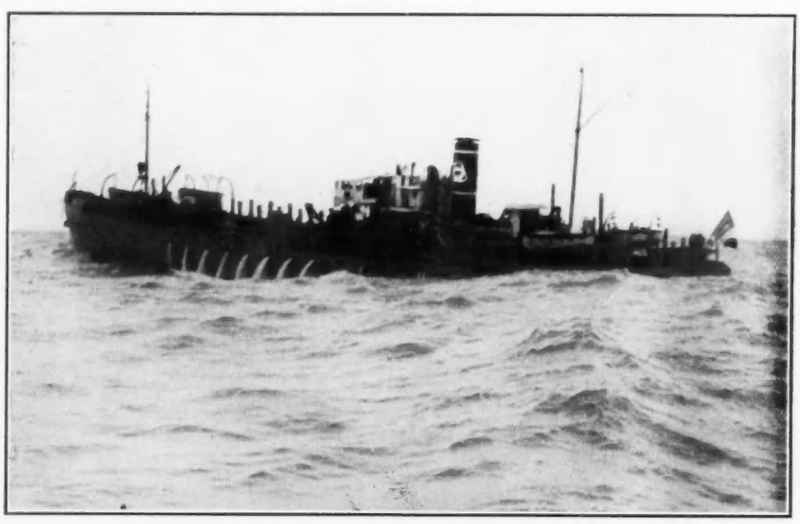
Complete Success at St. Nazaire.

It was to these two powerful machines that was entrusted the task of opening a passage to the sea for the liner "Normandie." They acquitted themselves of this task with complete success.

Arriving at St. Nazaire on 26th September, 1934, their work proceeded from that date onwards to its conclusion, continuously throughout the winter, without other interruptions than those occasioned by revictualling, repairs and abnormally bad weather. By 1st May, 1935, that is after seven months' working, the spoil removed amounted to 4,153,000 cubic metres: 2,400,000 from the Charpentiers Channel and 1,753,000 from the Bonne Anse Channel. The greatest monthly output was that of March, at the total of 725,000 cubic metres (nearly one million cubic yards) for the two dredgers.

Comparison of the two sounding plans, in the accompanying Fig. 1, will show clearly the results achieved in seven months, thus proving the efficiency of the machines employed.

It may be remarked further that, by the employment of these two powerful suction dredgers from Bordeaux, the programme of deepening the St. Nazaire channel for the "Normandie" to come out was accomplished in less than the estimated time, and at a cost not exceeding two francs per cubic metre, equivalent to about 3d. at par, or 5d. at present rate of exchange, per cubic yard.



The Sea-going Suction Dredger "Pierre Lefort" dredging in rough weather in the Gironde Estuary.

Port of Southampton Topics

Steady Improvement in Docks Statistics.

SOUTHAMPTON DOCKS statistics for June are again highly satisfactory, and, following the good figures of recent months, indicate a steady and consistent improvement in the trade of the port.

Compared with the returns for the corresponding month of 1934, there are increases in eight out of the ten headings under which the docks traffic is divided.

The number of ships inward advanced from 305 to 323, and outward from 323 to 327, a total increase of 22. This was reflected in the tonnage returns. The gross figure inward rose from 1,568,334 tons to 1,661,590 tons, and the outward from 1,845,056 to 1,858,787 tons. The increase inward was, therefore, 93,256 tons and outward 13,731 tons.

Net tonnage inward was 900,454 tons, as compared with 808,225 tons in June, 1934, and outward the total was 1,003,814 tons, as against 942,852 tons, giving increases of 92,229 tons inward and 60,962 tons outward.

The volume of cargo handled again showed an aggregate increase, for although there was a drop of 4,294 tons in exports there was an advance of 4,922 tons in imports. Inward freight amounted to 59,298 tons, as compared with 54,376 tons, and outward cargo to 27,627 tons, as against 32,121 tons.

The number of passengers handled was less than in June, 1934, arrivals dropping from 30,904 to 28,550, and departures mounting from 27,875 to 28,567.

Nab Tower Radio Beacon.

Some idea of the assistance shipping will derive when the long-promised radio beacon on the Nab Tower materialises was furnished on July 11th, when the tug "Romsey" was despatched from Southampton by the North German Lloyd agents to transmit radio bearings to the "Bremen," which was crossing from Cherbourg.

The vessel had been delayed by dense fog outside the French port in the early morning, and when she cleared for Southampton conditions were little better. Fog in the eastern approaches to the port was very dense, and the fact that the Fleet were beginning to gather in Spithead for the Review complicated matters.

Acting on the instructions of the "Bremen's" Commander, the "Romsey" took up a position half-a-mile east of the Nab Tower, and for a full hour the "Bremen" groped her way through the fog and Fleet on bearings given her. Visibility was frequently no more than 50 yards.

The experiment was the first of its kind in Southampton, for although the French Line have been testing the advantages of stationing one of the tugs equipped with wireless in a position near the Warner Light the conditions have invariably been clear. The dense fog precluded any chance of the "Bremen" gaining a glimpse of the position of the "Romsey."

Two New Castle Boats at Southampton.

Two interesting new visitors to Southampton during July were the "Rothesay Castle" and the "Roslin Castle," two refrigerator cargo vessels of 7,000 tons each, which the Union Castle Line have had constructed to supplement their cargo tonnage. Very heavy demands have been made on this tonnage in recent years by the great increase in citrous and deciduous fruit shipments, which now run into millions of boxes a year.

Prior to the delivery of these vessels the Union Castle Company found it necessary to charter ships such as the "Nogoya," "Nasina," "Marconi" and "Millais" to assist their mail and intermediate vessels in catering for this fast-growing trade. With the entry into the service of these two new vessels, the situation has been greatly eased.

North German Lloyd Liner "Potsdam" calls at Southampton.

Southampton was interested to see the new 18,000-ton North German Lloyd liner "Potsdam" when she called here on her maiden voyage from Bremerhaven to the Far East early in July.

"Press-the-button" steering is the new and revolutionary feature introduced on the ship. The system of steering entirely dispenses with the ship's wheel, and an alteration of course in either direction can be brought about with the expenditure of no more energy than is required to blow an electric motor horn.

The North German Lloyd service to the Far East is to be maintained by three vessels, the "Scharnhorst," which is returning after experiencing a certain amount of trouble on her maiden voyage, the "Potsdam" and the "Gneisenau." The last-named is now being built at Bremen.

The three vessels, while having the same tonnage, are different from the point of view of hull and engine design, the underlying idea being to test which is the most satisfactory combination.

Irish Harbour Matters

Cork Harbour Board.

CORK HARBOUR BOARD has adopted a motion by the Lord Mayor (Alderman French), that the Order of 29th May, reducing pensions up to £100 by 5 per cent., from £100 to £200 by 10 per cent., and over £200 per annum by 20 per cent., be rescinded.

They made a recommendation that the cuts in pensions of over £250 be referred to the Economy Committee.

The Lord Mayor said that there had been an honourable contract with those who had retired on pension. Some of the retirements had taken place at the request of the Board with a view to economy. The saving of, roughly, £350 per annum gained by the cuts was so small that it would not affect the Board's finances.

Mr. J. J. Horgan, solicitor, seconded the motion.

Dues on American Ships.

The Free State Department of Industry and Commerce has written to the Cork Harbour Board indicating that an arrangement has been concluded with the United States Government whereby certain American vessels will, in future, be furnished with special appended tonnage certificates, calculated in accordance with international practice.

The Department directed that, in Free State ports, dues are to be levied on the basis of the tonnage shown on appendix certificates and not on certificates of registry. A list of vessels covered by agreement was furnished.

The General Manager to the Board said that the agreement would mean, in the case of s.s. Washington, an increase in dues from £28 17s. 10d. to £42 7s. 8d.

Mr. Wallace said that the tonnage which the Board always accepted was regulated by British measurements, and not measurements of the U.S.A. If these ships were to pay more on American tonnage than British ships on British tonnage, American ships might well cut out the Port of Cork. He suggested that the matter be referred to the Law Adviser to inquire what was the exact meaning of the agreement.

Mr. Mercer said it was an admitted fact that the American basis of tonnage varied from international practice, and if they accepted the American tonnage it would be giving a preference to American ships as against those of other nationalities.

Mr. Horne said he thought that the Department had been very much alive in the matter, and he saw no option but to accept the agreement, and to follow the Department's instructions.

The matter was then referred to the Law and Finance Committee.

Mr. J. C. Rohan, chairman, presided.

Civil Engineers and Dublin Port.

The Institution of Civil Engineers of Ireland will celebrate the centenary of their founding in Dublin on August 7th and 8th. Mr. Joseph Mallagh, Engineer to the Dublin Port and Docks Board, has arranged to conduct a party of the engineers over the port during their visit to the city.

At a meeting of the Dublin Port and Docks Board at which this was mentioned, Mr. P. J. Munden said that as engineers would be present from Great Britain and the Continent on the occasion, it would be a fine advertisement for the port.

The Chairman (Mr. T. F. Laurie) said that the programme of the Institution for the visit included visits to important engineering works either in progress or recently constructed in Dublin city and neighbourhood.

It was decided to place the tug "O'Coliemore" at the disposal of the visitors, and also that the Board should be officially represented at the public ceremonies in connection with the centenary.

Mr. T. F. Laurie, chairman; Messrs. Charles O'Kelly, vice-chairman; P. J. Munder and J. Mallagh were appointed delegates to the 16th International Navigation Congress to be opened at Brussels on the 2nd September.

News from all Quarters

South Africa

GENERAL surprise is expressed that the work at present in hand and about to be put in hand in Table Bay harbour differs entirely from the recommendations of the Nijhoff Commission. It has been generally believed that the scheme at present being carried out was suggested by Mr. Nijhoff, or at any rate, based on his suggestions, but now there appears to be no relation between them. It is common knowledge that the present scheme is not that suggested by the Government's own harbour experts, that, in fact, it goes against the recommendations of the Government's advisers. Shipping and commercial men are consequently asking whose ideas are being carried out, and why?

In the meantime, the Cape Town Chamber of Commerce has decided to press for the immediate putting in hand of works which would make provision for a deep-water berth on the land side of the New Basin. The decision was reached at a special meeting of the management committee and the harbour and shipping committees of the Chamber with the Chamber's representative on the Table Bay Harbour Advisory Board.

The meeting was held to consider the position which has arisen as a result of the recent publication of the Nijhoff report. In the course of discussion, surprise was expressed that the report had not been published earlier, as, in its main findings, it fully justified the urgent representations made to the Administration several months ago regarding the necessity for the earliest possible provision of more deep-water berths.

Strong rumours are prevalent in Cape Town that the completion of the two Union Castle 25,000-tons mail-ships will be postponed for a year, owing to the delay in providing suitable berthing accommodation for them in Table Bay. It is now officially admitted that the new deep-water quay cannot be ready until a year after the date promised, that is, about February, 1937. Temporary measures have been taken to provide berthing accommodation for them in Table Bay, along the South Arm side of the New Basin, but the Union Castle Company, it is said, does not look favourably upon this plan owing to the danger of delay or damage to ships during strorg winds.

In commercial circles it is considered unlikely that the Union Castle Line will go so far as to keep back the ships except as a last expedient. If the new vessels were kept idle, it would mean the waste of interest on a capital of approximately £2,500,000 for a year, apart from other expenses. "Perhaps the biggest blow," said the manager of a big shipping line, "would be the bad advertisement that Cape Town Harbour would get all over the world. It would also impede the whole development of South African shipping and would have a detrimental effect on the fruit export trade."

Canada

According to the annual report recently issued by the Vancouver Harbour Commissioners, the Port of Vancouver developed in a satisfactory manner during the year 1934, in spite of the general economic situation of the country remaining critical. Not only were improvements and extensions in the harbour plant and storage facilities carried out, but the goods turnover in traffic with other countries showed an improvement over the previous year's figures, although the records set up in 1930 and 1931 were not exceeded. The number of shipping companies whose vessels made use of the harbour amounted to 55 in 1934, as against 53 in the previous year. These maintained connections between the port and 49 foreign countries, as compared with 47 in the previous year. Of the ocean-going vessels entering and clearing, 52 per cent. passed through the Panama Canal. The total number of vessels enterirg and clearing in the harbour was 1,211 with a tonnage of 4,896,000 n.r.t. in 1934, as compared with 1,113 with 4,502,000 n.r.t. On the other hand, it must be noted that the total imports in sea-going traffic amounted to only 1,313,135 tons in 1934, as compared with 1,158,763 tons in 1933, and the total exports to 2,622,801 tons, as against 2,881,015 tons.

Netherlands East Indies

The traffic in the harbour of Belawan-Deli, the principal port of the island of Sumatra, has remained on an almost uniform level during the past three years. A reduction, in 1934, in the tonnage of the European vessels visiting the harbour was partially compensated for by an increase in the Japanese tonnage. The number of steam and motor vessels visiting the port from the principal countries during the past three years was as follows:—

	1932	1933	1934
Dutch East Indies	732	747	817
Holland	232	244	245
Great Britain	253	248	256
Germany	68	61	53
U.S.A.	15	13	12
Japan	22	24	25
Total	1,314	1,337	1,408

Japanese Possessions

The total imports over the port of Dairen in the period January-March, 1935, amounted to 702,000 tons, as compared with the 626,000 tons of the same period of 1934. Whilst the port was visited by three vessels less than in the same period of the previous year, the tonnage rose by about 163,000 b.r.t. The number and tonnage of the ships of the principal nationalities are given in the following table:—

	JANUARY-MARCH 1935 No. of Ships	JANUARY-MARCH 1935 Tonnage in b.r.t.	JANUARY-MARCH 1934 No. of Ships	JANUARY-MARCH 1934 Tonnage in b.r.t.
Japan	747	2,113,000	735	2,045,000
China	247	293,000	271	322,000
Manchukuo	63	61,000	74	76,000
Great Britain ...	63	338,000	64	317,000
Germany	23	163,000	17	120,000
U.S.A.	14	94,000	13	91,000
Holland	8	58,000	9	65,000

U.S.S.R.

Within the last four years, the importance of the harbour of Murmansk, which, as is well known, remains free of ice at all seasons, increased considerably in the handling of Russian goods traffic. It is officially stated that in 1934 the harbour was entered by 256 sea-going vessels, and cleared by 231 vessels. The goods turnover amounted to 76,598 tons entering, and 672,273 tons clearing. The latter figure compares favourably with those for previous years, which were 178,000 tons in 1931, 402,000 tons in 1932, and 465,000 tons in 1933. This rapid growth in the importance of Murmansk has resulted in the harbours of Riga and Reval losing their valuable position as transit harbours for Russian goods. As will be seen from the following table, Riga has in the past year dropped out altogether, and Reval has only handled 2,600 tons of Russian goods altogether:—

	Exports over Riga Tons	Exports over Reval Tons	Total Soviet Transit Exports Tons
1931	103,600	83,400	187,000
1932	33,600	53,700	87,300
1933	3,200	11,400	14,600
1934	—	2,600	2,600

It is believed that the goods handled in the harbour of Leningrad this year so far show a further improvement on the figures for last year. It is announced by the Export Trust that since the beginning of the present shipping season, no less than 442 steamers have been loaded with wood cargo for transport to foreign countries.

Danzig

The number of vessels entering the harbour of Danzig during the month of June amounted to 365, an increase of 2 over the previous month's figure, but the tonnage, on the other hand, fell to 220,273 n.r.t. The number of vessels clearing also increased—from 357 to 369—but here, too, the tonnage fell from 249,052 to 215,295 n.r.t. In comparison with June, 1934, incoming traffic fell by 48 ships and 25,260 n.r.t., and outgoing traffic by 49 ships and 29,829 n.r.t. For the first half-year of 1935, the decline in entering traffic amounted to 256 ships or 153,920 n.r.t. from the figures for the first half of 1934, and the drop in clearing traffic to 258 ships, or 145,635 n.r.t.

Spain

According to the official statistics, the total exports over the harbour of Alicante, during the year 1934, amounted to 48,500 tons, whilst the imports totalled 17,700 tons. The total number of vessels visiting the port from European countries during the year was 713 with a tonnage of 882,481 n.r.t., and the number from overseas 134 with 518,223 n.r.t., making a total of 847 with 1,400,704 n.r.t.

The Ministry of Finance has granted a permit to the harbour of Gigon for the erection of a free storehouse, in which goods coming from abroad may be temporarily warehoused free of duty.

The Port of Quebec

History.

THE discovery of the mighty St. Lawrence River—now one of the principal deep-water arteries of Inland navigation in America—is closely connected with the history of civilisation in the New World, and has been of paramount importance to the early explorers, as it afforded them an opportunity to penetrate into the unexplored wilderness of an immense country, many thousand miles long, and many thousand miles broad, covered with dense forests and high mountains, uninhabited by human beings save a few tribes of native Indians.

The origins of the port and city are traced back to the days when the hardy mariners of the 16th century first navigated the mysterious Atlantic Ocean on their frail and adventurous barks, in quest of new Empires which they hoped to discover with a view of increasing the wealth and prestige of their respective Motherlands.

In these early days, the locality and extent of the Western Hemisphere was very imperfectly understood by these navigators; the Atlantic was literally an unknown pathway to them, and it is no wonder that while various nations were seeking the same destinations, their explorers were drifted wide apart; the Spaniards reaching the fertile regions of Florida, and Jacques Cartier, with equal pride, entering the bays and rivers of the Northern country.

Sir James M. Le Moine, in his Annals of the Port of Quebec, describes as follows the arrival of the first pioneer vessels at the Indian Village of Stadacona (now the City of Quebec), in September, 1535,—forty-three years after the discovery of America by Christopher Columbus.

"Our port annals take one pretty far back in the dim past. Useless to scan Lloyd's Shipping List, or any marine almanac of the period for the mention of the "First Arrivals from Sea" at Quebec, on the 14th September, 1535: the three pioneer exploring vessels bearing the white flag of France:—"La Grande Hermine," 120 tons, Jacques Cartier, Master; "La Petite Hermine," 60 tons, Marc Jalobert, Master; "L'Emérillon," 40 tons, Guillaume Le Breton Bastille, Master, direct from St. Malo, France.

"All three had reached in safety their destination, without the assistance of pilots, lighthouses, beacons, buoys or other appliances with which our mighty river is now so profusely supplied; all three unannounced by telegraph, no quarantine regulations to comply with, nor customs officials to overhaul their manifests.

"Great had been the surprise and the alarm in the Indian village on the heights; not less the anxiety of the Chief Donnacona on contemplating the white sails and black hulls, and the "foreign devils," 110 all told, crowding on the decks of the unwelcome craft. Still greater their terror when Cartier's big guns roared out a salute, which echo repeated from hill to dale along the St. Lawrence.

"The occasion required the convocation of an Indian Council. Donnacona called together his braves; an address and offerings were tendered by the Great Chief, with 500 followers. This brought back a reply and presents for the Red Skins.

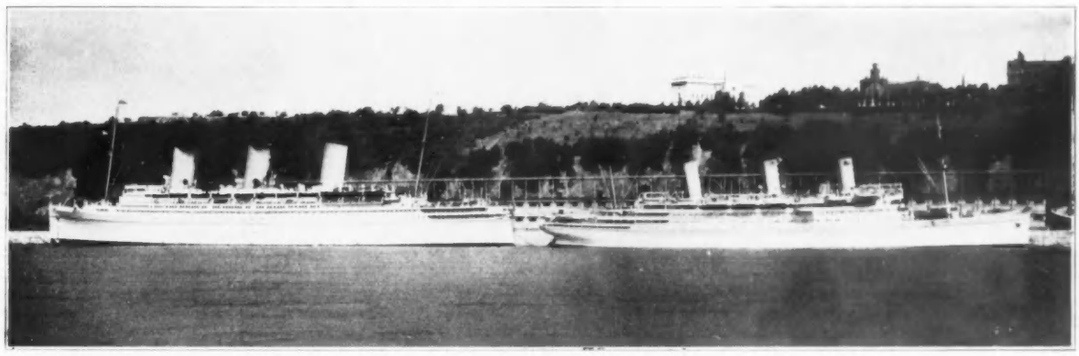
"Such, four hundred years ago, was the birth of European civilisation at the Harbour of Quebec."

After spending the long, dreary winter months at Hare Point, in the St. Charles River, Cartier sailed for his native land, on the 6th May, 1536, carrying with him six of the natives to produce to his royal master living exhibits of his discovery.

A lapse of six years intervened without any record of arrivals from sea when, in 1541, Jacques Cartier returned to Stadacona with a squadron of five vessels.

From 1541, the maritime chronicles of the port are shrouded in mystery, and France, engaged in almost continuous wars on the European Continent, does not appear to have made serious attempts to organise any permanent establishments in America, until the arrival of the immortal Samuel de Champlain, who founded Quebec, the "Walled City of the North," on July 3rd, 1608.

From 1608, France held her colony for a period of one-and-a-half centuries, implanting the seeds of her social, intellectual and religious life into the soil of the New World.



SS. "Empress of Britain" and SS. "Empress of Australia" at Shed "A," Wolfe's Cove Terminals, Quebec Harbour.

The Seven Years' War, in which France and England were engaged on the European Continent, culminated on this side of the Atlantic in the famous battle of the Plains of Abraham, in 1759, when Canada passed from French to British rule.

Developments of the Port.

Quebec City (Lat. 46°, North; Long. 71°, 13' West) is located on the St. Lawrence River, at the estuary of the River St. Charles, 180 miles above the entrance to the Gulf of St. Lawrence at Father Point, and 166 miles below Montreal by the river.

It is in a commanding position at the mouth of the Great Natural Waterway.

Quebec possesses exceptional facilities for the berthing of deep-draught vessels, and can accommodate at her spacious wharves the largest passenger and freight steamers afloat. Its development from a few scattered wharves and piers built by private interests has progressed under successive authorities, commencing with the establishment by Act of Parliament of "Trinity House," a body having power of administration over the Port of Quebec and with jurisdiction over the body of pilots. In 1858 the Board of Harbour Commissioners was formed, and these two bodies functioned simultaneously until the year 1876, when the powers that still appertained to the "Trinity House," were transferred to the Quebec Harbour Commission.

The first big development of the Port of Quebec began a few years before the disappearance of the old "Trinity House." Its conception was due to two eminent engineers, Messrs. Kinniple and Morris. A general outline of a plan, embracing practically all the wharves of that time, and also some considerable enlargements in the estuary of the River St. Charles, was prepared and put into execution in the course of subsequent years.

The different commissions which have taken office since that date have gradually increased these facilities until to-day it can be said that the port is in a position to accommodate ships of any size and cargoes of any nature.

A summary of these facilities show that the port has thirty-three steamship berths ranging from 700 ft. to 700 ft. in length; some 749,023 sq. ft. of shed space; a modern grain elevator of 4,000,000 bushels capacity; a cold storage warehouse; two graving docks, one of which can accommodate the largest vessel afloat; cranes for handling coal, sulphur and other commodities; tugs, scows and other essential equipment.

The year 1931 marked one of the most remarkable periods in the history of the Port of Quebec. It witnessed the completion of an extensive programme of port contruction undertaken in 1925 at Wolfe's Cove to provide the port with the most modern facilities for the accommodation of deep draught

Port of Quebec—continued

vessels. This new terminal, said to be the most modern on the American Continent, was officially opened on June 1st of that year, when the magnificent Canadian Pacific liner "Empress of Britain" completed her maiden voyage from Southampton to Quebec, thus fittingly inaugurating the great new docks.

This portion of the Harbour of Quebec, which consisted formerly of undeveloped and unproductive beaches, has been transformed into a new, deep-water port, where the largest and most powerful steamers can find suitable and well-protected berths, as well as required facilities for the handling of passengers and cargo. These facilities, which have now been in operation four years, form part of a general plan providing for the gradual development of the North shore of the River St. Lawrence, covering a distance of about three miles from Cape Diamond to Sillery.

The Quebec Harbour Commissioners have thirty-two miles of tracks on docks for the handling of freight. Shunting on the docks is done by the Harbour Commission.

The Canadian Pacific Railway, the Canadian National Railways, and the Quebec Central Railway have their Quebec terminals right within Quebec Harbour.

Railway Freight Rates.

The Railway Freight Rates on all traffic from Toronto and points West of that city, as well as the rates on grain from the Georgian Bay Ports to Quebec for export, are the same as to Montreal and the other ports on the St. Lawrence River above Quebec.

The rates on the all-rail movements of grain from Port Arthur, Fort William and Armstrong, over the National Transcontinental Railway are about equivalent to the rail and water rates combined, from Port Arthur and Fort William via the Georgian Bay Ports to Montreal and the other ports above Quebec.

The Port of Quebec is open for navigation for a period of nine months of every year. Besides, some of the Canadian Government steamers usually make winter cruises to the Lower Ports of the Gulf of St. Lawrence, as the river, although carrying floating ice, never freezes from Quebec down to the sea.

Notes of the Month

Increase in Passenger and Cargo Traffic at Southampton.

The first six months of 1935 show still further increases in passenger and cargo traffic, as compared with the corresponding period of 1934, at the Southern Railway Docks at Southampton.

Passengers increased by 6 per cent. and cargo by 8 per cent., whilst the inward shipping gross tonnage advanced from 7,700,712 tons to 7,865,803 tons.

During the month of June alone, 18 more vessels entered the docks than last year.

Trade at the Hull Docks.

The general state of trade at the Hull Docks is not as satisfactory as it might be, owing to the shrinkage of volume in the principal sections of the import and export commerce.

In the first six months of the present year arrivals of wheat and kindred cereals, at 536,378 tons, showed a decline of 95,000 tons, as compared with the corresponding period last year. On the other hand, imports of oilseeds, nuts and kernels aggregated 370,000 tons, and were 35,000 tons advance. Imports of sawn wood were 92,000 loads less, but pit wood showed an increase of 33,000 loads. Provisions, usually a large business, exhibited a considerable decrease, and there was also a falling off in the arrivals of fruit and vegetables. Sheep's wool showed a 60 per cent. increase, while the imports of petroleum at the Saltend Depot exceeded 82 million gallons, an increase of nearly 11 million gallons. Exports of general merchandise are at a fair level, but coal shipments lag behind and are only about half what they were three or four years ago, owing to the restrictive effect of the Coal Mines Act and other causes.

Preston Dock Inspection.

A party of fifty paper-makers, wood pulp and china clay importers, made an inspection of the Preston Docks and the River Ribble a few days ago from the Preston Corporation's tug "Perseverance." The party had been invited by the Preston Corporation to give the representatives an opportunity of seeing the Ribble undertaking and the improvements which have been made during the last few years, especially in the handling of pulp cargoes.

Mr. H. Howarth, the Ribble engineer, pointed out the facilities which the dock affords, and explained the working of the sand pump and dredgers. He also drew attention to the training walls, which are being built with a view to accommodating larger-sized vessels and making the port safer for ships of a bigger tonnage.

The company included representatives from all the large paper mills in Lancashire, and several London and Manchester wood pulp importers.

New Dredger for Isle of Man.

Isle of Man Harbour Board has decided to build a new dredger at a cost of £8,000. It is likely to prove a sound investment, for in the past twelve years nearly £90,000 has been paid by the Harbour Board to a private company for dredging—over £60,000, of which was in connection with the Red Pier scheme. The "Sirdar," a barge purchased by the Board for a few hundred pounds, has outlived her usefulness in some respects, but she is to be retained as a dummy barge for work in conjunction with the new dredger.

The new vessel will be a grab-hopper dredger and will be capable of handling something like 300 tons of material in a normal working day. Her approximate dimensions are 90 ft. long, 23 ft. broad, 7½ feet deep, with a draught of 6 ft. loaded. She will have 100 tons hopper capacity, and will be capable of steaming at from six to eight knots. It has been stated, on behalf of the Board, that there is continuous employment for a dredger in the harbours of the Island.

Bombay Port Trust.

At a meeting of the Trustees of the Port of Bombay, held on 18th June, 1935, the following were the main items of business disposed of:—

Government Notification appointing Mr. G. Wiles, C. S. I., C. I. E., I. C. S., as Chairman, Bombay Port Trust, was recorded. Mr. Wiles was elected to represent the Port Trust on the Local Advisory Committees of the G. I. P. and B. B. & C. I. Railways, on the Executive Committee of the Infant Welfare Society, and on the Committee of the Indian Sailors' Home.

The election by the Indian Merchants' Chamber of Mr. Manu Subedar as a member of the Board of Trustees, *vice* Mr. A. D. Shroff proceeded on leave to Europe, was recorded.

Amendments of the Docks and Bunders Scales of Rates were approved (subject to the sanction of Government) transferring "Milton" water, a disinfectant fluid, for purpose of assessing wharfage from Drugs and Medicines to Liquid Disinfectants.

Minor items of expenditure sanctioned included the provision of additional bollards at Frere Basin for the use of country craft and enclosing with expanded metal the waiting-room at New Ferry Wharf for the better protection of passengers' baggage at night.

Port of Rotterdam.

The Chamber of Commerce and Industry of Rotterdam has recently issued the statistics concerning the movement of seagoing ships in the New Waterway, and which are as follows: During June, 1935, 840 ships with a net registered tonnage of 1,341,909 tons entered the Port of Rotterdam, as compared with 976 ships of 1,464,631 n.r.t. during June, 1934. The number of ships entering for the small ports in the environs were 194 of 404,889 n.r.t., as compared with 194 of 341,718 n.r.t. in June, 1934.

For the half-year ending June, 1935, 5,378 ships of 8,708,339 n.r.t. entered the port, as against 5,541 of 8,599,492 n.r.t. in the first six months of 1934. The number of ships entering for the small ports in the environs of Rotterdam during the first six months of 1935 were 1,175 of 2,387,233 n.r.t., as compared with 1,312 ships of 2,317,885 n.r.t. in the corresponding period of 1934.

After deducting the number of ships counted more than once in the different ports, the number of entrances during the month of June, 1935, amounted to 985 of 1,617,654 n.r.t., as compared with 1,142 ships of 1,745,663 n.r.t. in June, 1934. For the first six months of 1935 the figure is 6,190 ships entered of 10,097,184 n.r.t., as compared with 6,455 ships of 10,071,900 n.r.t. for the first six months of 1934. These figures are for the whole region of the Port of Rotterdam with its environs comprising the delta formed by the mouths of the Rivers Rhine and Meuse.

Near Eastern Port Matters

THE Chamber of Commerce and Industry of Split has just published full statistics concerning shipping at Jugoslav ports during 1934, and which are as follows:—

	ARRIVALS AND CLEARANCES		GOODS UNLOADED AND LOADED		
	No.	N.R.T.	Jugoslav Ports Centals	Foreign Ports Centals	Total Centals
1926	69,772	20,219,727	3,693,985	15,699,250	19,393,235
1927	70,984	11,891,486	5,357,468	16,988,883	22,346,351
1928	84,980	14,397,683	5,772,377	20,508,110	26,280,487
1929	91,913	14,937,288	5,437,263	24,467,392	29,904,655
1930	96,474	14,976,525	5,039,251	23,140,567	28,179,818
1931	101,135	16,678,431	5,277,107	19,730,488	25,007,595
1932	91,243	15,788,773	4,843,653	15,047,334	19,890,987
1933	92,120	16,440,248	4,698,114	16,397,275	21,095,389
1934	92,291	17,382,128	4,747,700	19,851,609	24,599,309

After trade having decreased in 1932, Jugoslav shipping has shown a revival in 1934, due especially to the increase in exports of lumber which reached 5,854,182 centals in 1934.

The position of the various countries calling at Jugoslav ports during 1934 is as follows:—

	IMPORTS Centals	EXPORTS Centals	TOTAL Centals
Jugoslavia	1,970,160	5,250,300	7,220,460
Albania	4,450	138,926	143,376
Denmark	163,440	46,509	209,949
Britain	468,296	740,020	1,208,316
Egypt	—	65,200	65,200
Finland	51,580	—	51,580
Greece	484,827	700,428	1,185,255
Holland	55,335	81,801	137,136
Italy	457,043	8,612,186	9,069,229
Lithuania	—	58,000	58,000
Germany	71,724	63,247	134,971
Norway	63,144	146,532	209,676
America	74,431	—	74,431
Spain	37,500	—	37,500
Sweden	1,016	3,200	4,216
Turkey	—	41,314	41,314
	3,902,946	15,947,663	19,850,609

In connection with imports, Jugoslavia occupies first place, followed by Greece and Britain, while in exports first place is occupied by Italy, followed by Jugoslavia and Britain. Most of the British coal imported into Jugoslavia has been carried by British ships, while the reason for the predominance of Italy in exports is accounted for by reason of a great part of Jugoslav exports being goods shipped to Italy. The first place among Jugoslav ports, is occupied by Split, followed by Sussak, Dubrovnik and Sibenik, but in the course of 1934 there has been considerable progress in exports from Metkovich, which is connected to the hinterland by the River Narenta and by a reduced gauge railway to Mostar, Sarajevo and Belgrade. The following figures give an idea of the situation of trade at the leading Jugoslav ports:—

	Arrivals and clearances from and to Jugoslav ports	Arrivals from foreign ports	Clearances to foreign ports	Total Shipping
SPLIT				
1913	1,265,833	642,683	2,528,035	4,436,551
1930	1,264,066	1,302,396	8,239,893	10,806,353
1931	1,542,610	1,416,667	7,318,347	10,277,624
1932	1,519,782	1,012,314	5,508,413	8,040,509
1933	1,513,729	974,849	5,350,570	7,839,148
1934	1,585,200	1,072,773	6,970,806	9,628,779
SUSSAK				
1913	—	—	—	—
1930	832,434	2,404,421	3,773,542	7,010,397
1931	843,894	1,457,860	3,355,126	5,656,880
1932	761,566	891,893	2,551,327	4,204,786
1933	778,332	1,406,516	3,326,668	5,501,516
1934	819,104	1,118,458	3,967,604	5,905,166
DUBROVNIK				
1913	322,086	321,886	1,343,530	1,987,502
1930	230,084	1,014,564	2,088,286	3,332,934
1931	184,005	1,397,534	1,317,115	2,898,654
1932	186,767	1,057,334	984,113	2,228,214
1933	199,146	1,209,562	1,216,548	2,625,256
1934	221,094	1,350,279	1,491,567	3,062,940
SIBENIK				
1913	757,290	319,115	1,064,006	2,140,411
1930	215,596	191,734	1,841,142	2,248,472
1931	209,149	141,292	1,590,424	1,940,865
1932	208,357	47,426	1,563,309	1,819,092
1933	215,128	32,018	1,539,917	1,787,063
1934	232,524	51,412	1,699,333	1,983,269
METKOVICH				
1913	528,120	4,683	426,550	959,353
1930	483,894	117,696	353,280	954,870
1931	502,662	142,100	175,187	819,949
1932	326,052	70,294	134,479	530,825
1933	291,123	96,456	243,445	631,024
1934	298,421	84,892	426,420	809,733

At Split shipping during 1934 has shown an improvement in respect to 1933, but it has not reached as yet the 1930-1931 period figures. On the other hand, during 1934 shipping at Split has shown an increase of about 110 per cent. in respect to 1913, which increase is due especially to the expansion of foreign trade. Over 65 per cent. of the goods shipped from Split is represented by Jugoslav cement, while most of the goods shipped from Sussak include lumber. The Port of Split has been fitted with up-to-date facilities, including 10 electric cranes with a capacity varying from 1.5 to 3 tons, and new storage facilities. If to this one adds the important oil bunkering station, which has just been erected, and the efficient Franco-Jugoslav ship repairing establishment which exists at Split, it is certain that Split has to-day all the factors necessary to make it one of the best-equipped ports in the Adriatic. At Sussak, instead, things are still difficult as, in spite of all the projects which have been worked out, it has been impossible to settle the problem of the enlargement of that port, owing to the fact that the depth of the water off the port is over 80 metres, and that consequently the building of a large breakwater would be highly expensive, and at present there is no prospect of a sufficient increase in traffic to warrant the necessary expense.

According to statistics, which have been published by the Statistique Générale de la Grèce, shipping at Greek ports during the first two months of 1935 included the arrival of 471 vessels, representing 776,765 n.r.t., against 436 vessels and 809,010 n.r.t. arrived during the corresponding period of 1934, and the clearance of 362 vessels, representing 662,690 n.r.t., against 343 vessels and 604,537 n.r.t., which left Greek ports during the period January and February, 1934. There has been a slight decrease in arrivals, and an increase in clearances. During January, 1935, there was a drop in the imports of coal and wheat at Greek ports, while in February several vessels left Greek ports in ballast, both for South America and the Far East. The position of the various foreign countries participating in Greek shipping in January and February are as follows:—

	1935				1934			
	ARRIVALS		CLEARANCES		ARRIVALS		CLEARANCES	
	No.	N.R.T.	No.	N.R.T.	No.	N.R.T.	No.	N.R.T.
America ...	4	13,517	7	23,986	3	9,762	6	20,264
Britain ...	21	33,208	25	54,084	25	98,242	19	22,448
Holland ...	7	11,217	9	12,045	5	10,677	4	6,102
France ...	9	46,239	8	45,704	9	28,859	9	28,859
Germany ...	17	29,033	26	39,920	13	19,088	15	27,931
Italy ...	153	333,451	142	293,511	158	359,628	144	314,908
Roumania ...	27	34,534	28	34,191	28	41,774	27	40,535

Britain occupies fourth place as far as arrivals are concerned, and second place in clearances. While there has been a certain improvement in connection with the share of Britain in clearances from Greek ports, the share in arrivals has greatly decreased. A substantial improvement has taken place only as far as France and Germany are concerned.

The following table shows the position of each Greek port during the period January and February, 1935, compared with the corresponding period of 1934:—

	1935				1934			
	ARRIVALS		CLEARANCES		ARRIVALS		CLEARANCES	
	No.	N.R.T.	No.	N.R.T.	No.	N.R.T.	No.	N.R.T.
Volos	3	2,605	5	3,516	5	4,930	9	12,399
Heraclion	10	8,357	17	20,619	10	13,414	9	10,655
Salonika ...	23	27,143	32	46,963	21	36,698	25	35,607
Cavalla ...	8	9,497	10	21,366	5	8,973	—	—
Calamata ...	4	6,700	16	19,508	6	6,079	11	13,114
Corfù ...	44	37,449	33	26,937	36	31,194	31	27,464
Mitilene	4	4,572	5	4,901	17	15,696	12	16,992
Patrass ...	28	79,335	25	90,775	27	81,962	27	95,552
Pireaus ...	313	588,852	171	365,222	286	571,631	174	330,814

It is announced that the Greek Government has decided to undertake the construction of the new quayage along the Southern part of the Port of Pireaus according to the project worked out by an Italian engineer, and to build a passenger landing stage for large liners in the Phaleron Bay.

The Manchester Ship Canal Company

The traffic receipts for the Manchester Ship Canal Company for the month of June, 1935, totalled £101,865, as compared with £108,806 in June of last year, this being a decrease of £6,941. For the half-year ending 30th June, 1935, traffic receipts amounted to £615,444, this being an increase of £12,519 over the corresponding period for last year, the figure for which was £602,925. The net revenue of the whole undertaking for the half-year (after providing for interest and fixed charges) was £11,334 less than the corresponding half-year in 1934.

A Large Wagon Tippler for China

Fraser and Chalmers Engineering Works (Proprietors: The General Electric Co., Ltd.,) has just constructed a special form of the Marshall Wagon Tippler, for use on the Lunghai Railway Co., China. This tippler, which is seen in the accompanying illustrations, is designed to handle wagons having a maximum capacity of 40 tons, and as the wagon itself weighs about 18 tons, the tippler is rated nominally as a 60-ton machine in that it has been designed to cope with a gross weight of 60 tons.

Fig. 1. Trucks on the Tippler before Tipping commences.

Fig. 2. Showing position of Trucks at extreme point of Tipping.

The tippler is required to handle either 40-ton capacity trucks at the rate of 10 trucks per hour or (as will be the usual case) 20-ton trucks at the rate of 20 trucks per hour; if required, however, 40-ton trucks can readily be tipped at the rate of 20 per hour, making the total capacity 800 tons per hour. The 20-ton capacity trucks measure 29 ft. 6 in. long over body with a tare weight of 10 tons, while the 40-ton capacity trucks are 42 ft. 8 in. long, and have a tare weight of 18 tons. The machine is constructed to tip either one or two 10-ton trucks at the same time.

The broad principle of design upon which this type of tippler is based is as follows:—The wagon is clamped on to a platform, which is pivoted at the front of the tippler to the main framework, and the whole mass is revolved about the pivot point by means of hoisting ropes and winches, assisted by suitably arranged balance weights, which serve to counteract excess moments and retain the clamping gear in position at all points of the revolution during the cycle of operations. The speed of the operation of tipping during the varying conditions of loads met with throughout the cycle is regulated by a special voltage control system working in conjunction with a 75 h.p. d.c. Witton motor, which receives its supply from an a.c.-d.c. motor generator set; the whole of the electrical gear, including the motor generator set, was manufactured by The General Electric Co., Ltd., at its Witton Engineering Works.

Port of London Notes

London's Shipping.

During the week ended June 28th, 1,011 vessels, representing 1,124,685 net register tons, used the Port of London. 548 vessels (937,273 net register tons) were to and from Empire and Foreign Ports, and 463 vessels (187,412 net register tons) were engaged in coastwise traffic.

Twenty-eight timber-laden vessels arrived at the Surrey Commercial Docks with 59,915 tons of softwood.

* * * *

During the week ended July 5th, 846 vessels, representing 868,430 net register tons, used the Port of London. 469 vessels (723,066 net register tons) were to and from Empire and Foreign Ports, and 377 vessels (145,364 net register tons) were engaged in coastwise traffic.

Twenty-four timber-laden vessels arrived at the Surrey Commercial Docks with 54,169 tons of softwood.

* * * *

Busy Week for Shipping on the Thames.

The second week in July proved a busy week for London's shipping, when 1,250 vessels, representing 1,115,302 net register tons, used the Port of London during the seven days ended July 12th. Of these, 560 vessels (867,237 net register tons) were to and from Empire and Foreign ports and 690 vessels (248,065 net register tons) were engaged in coastwise traffic.

Nineteen timber-laden vessels arrived at the Surrey Commercial Docks with 41,264 tons of softwood.

Tilbury Landing Stage.

The week ending July 19th constituted a record for ships using Tilbury Passenger Landing Stage. No less than 33 ships aggregating 341,000 tons arrived at or departed from the stage. Most of these liners were engaged in cruising.

Over a Million Tons of Shipping.

London shipping circles have had another busy week. 1,264 vessels, representing 1,053,746 net register tons, used the Port of London during the seven days ended July 19th. Of these, 524 vessels (790,643 net register tons) were to and from Empire and Foreign Ports, and 740 vessels (263,103 net register tons) were engaged in coastwise traffic.

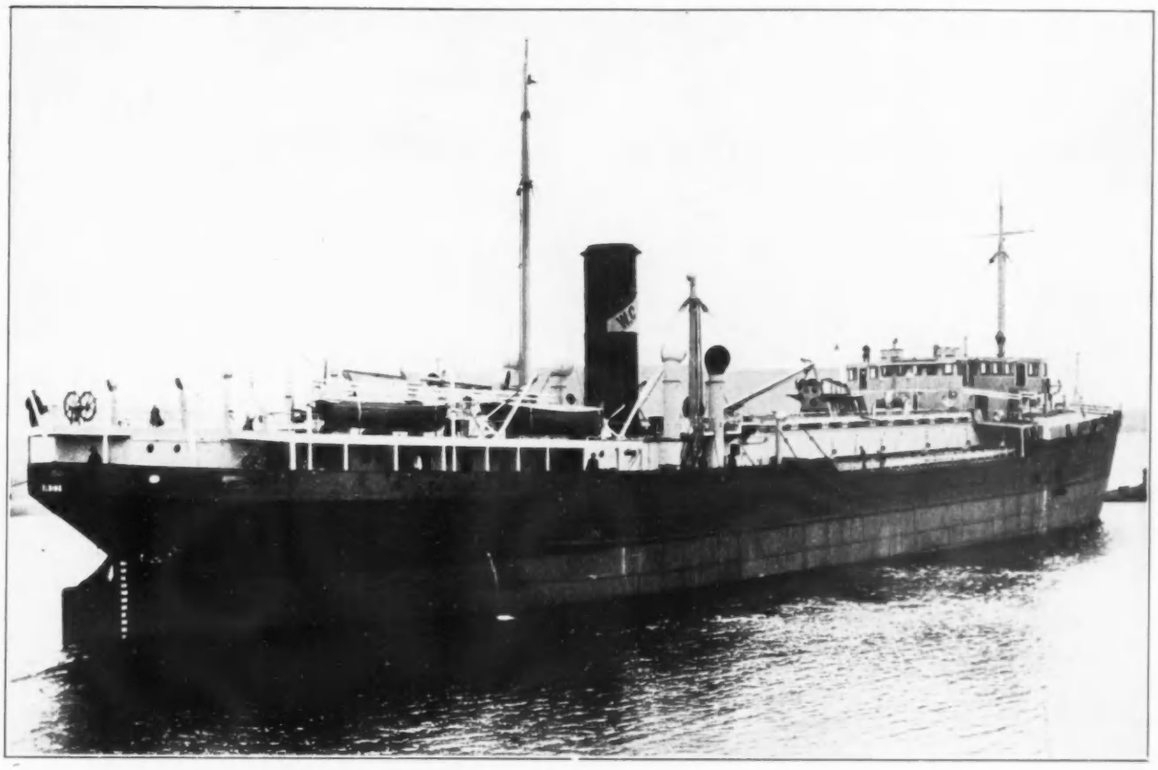
Twenty-two timber-laden vessels arrived at the Surrey Commercial Docks with 37,053 tons of softwood.

Dredging at Maryport.

The work of dredging and clearing the bank which threatened to close the channel entrance to Maryport docks and harbour, has been in progress recently. The Commissioner for Special Areas, Mr. Malcolm Stewart, allowed a grant of approximately £4,000 for the work.

Whangpoo Conservancy Board

Successful Trials of the Drag Suction Dredger "Chien She"



The Drag Cutter Suction Dredger "Chien She."

THE large drag suction dredger for the Whangpoo Conservancy Board, which was described in our issue of April, 1934, was completed by the German builders, Messrs. Schichau, early this year and arrived in Shanghai after an uneventful voyage in the middle of April.

After docking and some small adjustments, she was put on to the contract trials, and up to the time of our information had fulfilled these in a most remarkable way.

The specification, prepared by Dr. Chatley, Engineer-in-Chief to the Whangpoo Conservancy Board, was an exceedingly severe one, calling for an hourly dredging of 2,500 cubic yards to be transported two miles. The mud, although comparatively soft, was very dense, being estimated at 80 per cent. greater density than that of water. The tidal currents are exceedingly strong, and at times the depth of water available for the vessel is less than 20 ft.

View of Hoppers with thick mud entering.

In our previous article the general characteristics of the vessel were described, but it is of interest to recall that she is 360 ft. long, 60 ft. beam, and when fully loaded draws a little over 18 ft. Her loaded displacement tonnage is over 8,000, and the hoppers have a capacity of 3,700 cu. yds. In actual working she is designed to carry 4,000 tons of diluted mud. The actual developed propulsion power with the twin screws is about 2,800 h.p., and the main pumping engine has displayed as much as 3,000 h.p., so that there is nearly 6,000 h.p. available for the operation of the vessel.

In order to fulfil the contract, it was absolutely essential that the density of the mixture should approach 1½ times that of water, and in actual fact this was exceeded at the actual trials. In many cases the proportion of mud in the mixture reached as high as 80 per cent. so that it emerged from the discharge into the hoppers in a thick porridgy condition, which is very surprising to see. This extremely useful result has been obtained by the liberal use of propulsion power, the construction of a suction pipe of the largest convenient diameter and the shortest length, the pump being placed as low in the vessel as possible and free of internal obstruction, and in particular by an arrangement by which the high pressure diluted water, which is fed into the drag head, enters that head by flush jets sloping backwards so that instead of, as has frequently been the case in the past, an attempt being made to break up the mud by the impinging of the jets of water, the latter has been introduced in the form of a sheet of high-pressure water flowing in the same direction as that which the mud has to follow.

The vessel is exceedingly well constructed, having been supervised in Germany by the Board's own representative, Mr. Wm. Smith, M. I. N. A., and Lloyd's Surveyors. It is classed as a dredger + 100 A.1. at Lloyds, and is equipped very thoroughly with good accommodation for tropical conditions. She is arranged to burn local Chinese coal, but can also use oil fuel if considered necessary. She has capacity in the bunkers for about 400 tons of coal and 150 tons of fresh water. She has actually moved over the river bottom with the drag head buried, at three knots, and when cruising for dumping or pumping overboard she has a speed of over 10 knots. It is hoped that it will be possible to remove

Whangpoo Conservancy Board—continued

five million tons of mud per annum with this vessel working only during daylight hours, and later on to provide a second vessel of a similar kind, and it is estimated that the two together, in the course of five years, will produce such an improvement in the enormous bar of the Yangtse River that the largest ships plying on the Pacific will no longer be delayed or have to adapt their sailing time to the tides.

A survey vessel and buoy tender has been built specially to wait on the dredger and numerous fixed marks have been put up in difficult conditions to serve as survey points on the bar, which is, from most points of view, as if it were in the open sea since the shores are several miles from the dredger position and slope so gently that the high-water mark is many miles away.

We show a general view of the vessel just before she left Danzig, a view of the hoppers showing the thick mud entering them, and a view of one with the discharging shoot, which last clearly shows the extraordinary thickness of the mud. The vessel has been named "Chien She," which means "Reconstruction," which is one of the slogans of the present Chinese Government. Considerable attention has been drawn to this vessel in Chinese circles, and it is perhaps worth mentioning that, to the best of our knowledge, it is the second largest dredger in the world and the first from the point of view of power. The larger vessel, which is the "Leviathan" on the Mersey, is only a sand pump and does not operate with a drag.

Discharge Shoot showing thick mud.

News from German Ports

Hamburg Port Construction Work.

It is authoritatively reported that a loan of Rm. 5 million is to be raised for the purpose of carrying out structural improvements to Hamburg's harbour. A further sum of Rm. 800,000 is to be provided for the same purpose out of the funds of the Reich Institute for Unemployment Insurance.

A sum of Rm. 2 million is to be devoted to the construction of the Togo Quay alongside the Sud-West Hafen basin for the so-called "Freiladeveckehr," i.e., the direct transfer of mass goods for ship to rail and vice versa.

Over Rm.500,000 is to be spent on dredging in the Hafenelbe and the Peute Canals, and this work is to commence at once. A further Rm. 500,000 is to be spent on repairs to quay walls, and a similar sum is to be expended on modernising the Port Railway system.

Of particular interest to organisers of pleasure cruises is the contemplated extension to the "Uberseebrucke," the landing stages for passenger vessels on the Vorsetzen waterfront. A further pontoon is to be added to the West side. Accommodation is to be provided at the Strandhafen adjoining the Gas Works for the temporary mooring of passenger vessels.

Seaborne Goods Traffic of the Weser Ports during April, 1935

(The figures in brackets refer to the previous month).

Total goods turnover of the Lower Weser Ports in seagoing traffic, according to a statement of the Statistical Office, Bremen, was 631,001 (640,608) tons. This slight decrease is due to a decrease in goods transport from 402,426 tons in March to 386,123 tons in April. Goods receipts, on the other hand, rose from 238,182 tons in March to 244,878 tons in April.

Of the total receipts of the Lower Weser Ports, 208,049 (201,904) tons, or 85.0 (84.8) per cent., were discharged in Bremen ports. This is an increase in goods receipts compared with the previous month by 2.8 per cent. Compared with the previous month larger quantities of barley, mineral oil, timber and wooden goods, cellulose, paper and metals were brought in. On the other hand smaller quantities than in the previous month arrived of rye, oats, podded grains, coffee, fruit and tropical fruits, fodders, coals and above all wool, cotton and other vegetable fibres.

Of the total despatches of the Lower Weser Ports, 342,302 (342,093) tons, or 88.7 (85.0) per cent. were loaded in Bremen ports. Chiefly flour, stones and earths, chemical products, nitrogenous manures, cellulose and paper were shipped in larger quantities than in March; on the other hand, despatch of coke, peat moss, rock salt, potash manures, timber and wooden goods decreased.

Weser Inland Shipping in April, 1935.

During April, due to considerable rainfall, water conditions on the Weser were favourable. Fully loaded barges were able to travel on the Upper Weser during 27 days and on the Middle Weser throughout the month. This is exceptional, as comparison with the figures for May show, when fully-loaded barges were only able to travel on the Upper Weser on the first seven days and on the Middle Weser up to the 12th. These bad shipping conditions are normal on the river and are likely to remain so until the canalisation has been completed.

Goods traffic through the Bremen Weser lock in April in both directions amounted together to 166,700 tons, and was thus 8,300 tons, or 5 per cent. more than in March. Traffic in April, 1934, was exceeded by 55,400 tons, or 50 per cent. During the month under review 127,800 tons arrived downstream, compared with 116,100 tons in the previous month; that is 11,700 tons, or 10 per cent. more. Cement, potash and salts as well as coal have increased. Piece goods, gravel and stones on the other hand decreased. Upstream goods traffic decreased at 38,900 tons, by 3,400 tons, or 8 per cent. This decrease is mainly due to falling-off in transport of mineral oils and grain.

During the past four months altogether 603,700 tons passed through the lock, that is 93,100 tons or 18 per cent. more than the same period of 1934. Goods downstream amounted to 435,800 tons, and exceeded the previous year's figures by 60,400 tons, or 16 per cent. Upstream, 167,900 tons passed through the lock, or 32,700 tons, equal to 24 per cent. more. Compared with the previous year downstream arrivals of potash and salt increased by 66,000 tons. Gravel and stones by 51,000 tons. On the other hand arrivals of Rhenish-Westphalian coal decreased from 168,800 tons to 129,200 tons, or by 23 per cent. This decrease is solely due to the excessive canal dues for bunkers. In 1928 from January to April, 350,000 tons of coal were brought in. Now only 37 per cent. of this main cargo of inland shipping remains, and it would appear to be possible that coal will have to give up its position in downstream traffic altogether, for this year it has already fallen below the level of gravel and stones and nearly to the potash figures.

Upstream traffic increased, chiefly due to increases in mineral oil transport. Besides this grain, flour, scrap, rice and foreign coal have increased. Piece goods and iron pyrites decreased and phosphate transport ceased altogether.

Vickers, Ltd.

The Directors give notice that the following Interim Dividends for the half-year ended 30th June, 1935, will be paid to the holders of the Preferred Stock and Preference Shares of the Company, who are registered in the books of the Company on Monday, the 5th August, 1935:—

- 2½ per cent. (less Income Tax) on the Preferred 5 per cent. Stock.
- 2½ per cent. (less Income Tax) on the 5 per cent. Preference Shares.
- 2½ per cent. (free of Income Tax) on the Cumulative Preference Shares.

Payment will be made on Friday, the 23rd August, 1935.

The Registers of Members relating to these issues will be closed from Tuesday, the 6th, to Saturday, the 10th August, 1935, inclusive.

Notes from the North

Liverpool Port Traffic.

RETURNS issued by the Mersey Docks and Harbour Board for the year which ended on 1st July, reveal a distinct improvement in the trade of the port.

Shipping rates were paid by 17,984 vessels of 20,478,492 tons, compared with 17,499 vessels of 19,969,354 tons in the previous year—an increase of 485 vessels and 509,138 tons. To arrive at the total tonnage which entered and left the Mersey, it is necessary to double these figures. The approximate total tonnage for the year just ended was, therefore, 40,956,984 tons, as compared with 39,938,708 tons a year ago, and 37,517,678 tons in 1933. The rates received on vessels were higher by £11,591, whereas those received on goods were £8,590 less. There was thus a net increase in the aggregate of rates and dues of £3,001.

The weight of goods discharged and/or loaded in the Board's docks for the year 1935 was approximately 13,600,000 tons, as compared with 13,230,000 tons in 1934.

The following details show how these totals are composed, the figures for 1934 being given in parentheses throughout :—

Paying dock tonnage rates were 3,908 vessels of 12,956,664 tons foreign (3,788 of 12,707,903 tons), and 8,278 vessels of 2,529,888 tons coastwise (8,212 of 2,476,785 tons), making a total of 12,186 vessels of 15,486,552 tons (12,000 of 15,184,688 tons).

Paying harbour rates only were 1,689 vessels of 3,649,628 tons foreign (1,632 of 3,557,935 tons) and 4,109 vessels of 1,342,312 tons coastwise (3,867 of 1,226,731 tons), making a total of 5,798 vessels of 4,991,940 tons (5,499 of 4,784,666 tons).

With regard to rates received on vessels, dock tonnage rates were £1,321,098 foreign (£1,306,904), and £79,520 coastwise (£77,323); harbour rates only were £51,780 foreign (£49,749), and £7,028 coastwise (£6,428).

Including receipts on conservancy account of £261,142 (£254,770), the total tonnage and harbour rates were £1,459,426 (£1,440,401). Adding graving dock rates £32,928 (£36,094), and dock rent £13,195 (£17,459), the total rates on vessels were £1,505,549 (£1,493,957).

On goods, dock rates were £140,909 foreign inwards (£458,328); £88,464 foreign outwards (£80,029); and £14 coastwise inwards (£62), making a total of £529,417 (£538,419).

Town dues were £312,710 foreign inwards (£321,161); £91,365 foreign outwards (£85,691); and £20,929 coastwise inwards (£20,441), making a total of £428,004 (£427,593). Since 1st April, 1929, outward coastwise town dues have not been charged on goods exported coastwise.

The total rates and dues on goods were, therefore, £957,421 (£956,012), and adding the rates on vessels the grand total is reached of £2,462,970 (£2,459,969), inclusive of the receipts on conservancy account.

Manchester Port Committee.

There has just been established at Manchester an organisation known as the Port of Manchester Committee, whose function it will be to promote co-operative action to foster trade for the port. The personnel of the Committee includes steamship owners, the C.W.S., and associations representing various branches of Trade. Mr. F. J. West, chairman of the Ship Canal Company, has been elected chairman.

Mr. W. E. Clucas, president of the Manchester Chamber of Commerce, said that by no means the least of the things that had won Manchester a place in the sun by meeting overseas demands, was the magnificent rounding-off of a highly-developed transport system in cutting an independent way to the sea.

It was their business to see that the area kept its elasticity and responsiveness by seeing that their foundation services were looking to the future.

The Committee might consider the preparation of a survey of commodities which passed between overseas ports and the area of Greater Manchester, without passing in substantial quantities through the port; the preparation of a report on what further steps can be taken to foster industrial development in the port zone, and the best means of creating greater knowledge of, and greater support for, the wide service the port can give.

How the Manchester area became more and more important after the opening of the Ship Canal, following its decadence as a trading area, was described by Lieut.-Col. T. H. G. Stevens.

If they closed the canal and did away with the seaport, he said, the area would grow derelict again. He described the thousands of loads of raw materials brought to Manchester by road from the ports of Liverpool and London, and the thousands taken back in the same way.

Rhyl Foreshore Works.

Details were communicated at a Ministry of Health inquiry at Rhyl on 10th July, of a £29,925 scheme for training the mouth of the River Clwyd, which, during recent years, has created a rather serious foreshore problem for the town.

It was stated that the River Clwyd has for many years past been a cause of much trouble and expense to the Rhyl Council, by reason of its scouring action after it debouches on to the foreshore between the western end of the Promenade and Horton's Nose, and by its continual tendency to make new channels for itself.

To obviate these difficulties, the Council now considers it desirable that the river should be confined to a permanent channel across the foreshore, while at the same time providing facilities for vessels, which have grown rapidly in numbers during the last three or four years. With these objects in view, the Council obtained engineering advice, and were advised to dredge a channel for the river to the westward of the old cast-iron outfall sewer. This dredging, however, proved to be ineffective, and the channel continued to flow more or less in an easterly direction, and has done so ever since. Subsequently, the Council applied to the Board of Trade for permission to continue the dredging operation, but were informed that before consent would be given, further advice should be obtained from someone possessing knowledge of the behaviour of shifting river channels through sandy estuaries. In consequence, the Council obtained the advice of a former engineer to the Mersey Docks and Harbour Board. He reported that the fixing of the channel across the foreshore could not, in his opinion, be permanently effected by dredging, and that "the only certain method to fix the channel is by forming a continuous embankment of rubble stone along the eastern side of the channel."

In 1933 application was made to the Board of Trade for permission to carry out the training works on the lines indicated in the report submitted by Sir John Wolfe Barry, Lyster and Partners, dated June, 1918, and subsequent reports. The Board of Trade, however, replied that in view of the long delay a further report on existing conditions should be obtained. The late Mr. Cruttwell visited Rhyl in July, 1933, and presented a report on behalf of the firm of Sir John Wolfe Barry and Partners to the Council. This report stated that great changes had taken place since 1920, but recommended that a training bank should be constructed of stone similar to those previously indicated, but with a somewhat different alignment and a sharper curve, so as to lead the river away more quickly from the shore. The report recommended that the training bank should be carried out in three sections, commencing at the shore end.

Further reports were furnished by Sir John Wolfe Barry and Partners to the Council. These reports not only dealt with the question of training the River Clwyd, but also with the protection of a considerable length of the promenade at its western end, which is in very bad repair, and also with a groyne projecting from the east side of Horton's Nose, designed to arrest erosion on the northern side and to prevent accumulation on the southern side of the river.

It is also recommended that a channel should be formed either by excavation or dredging on the western side of the groyne. It is thought that the groyne formed of a piled construction can be constructed in a shorter time and can be more accurately formed than by means of tipped stone. The stone work was originally proposed for the sake of economy, but urgency of the work and the necessity for maintaining a navigation channel has caused an alteration in these views. It is considered that the maintenance of a piled structure will be less than a stone embankment.

Mr. K. A. Wolfe Barry gave a description of the proposed works, which were summarised as follows:—(1) Sheet piled training groyne and new channel; (2) timber groyne on east side of Horton's Nose; (3) protective work to the west end of Promenade wall. The time required for the construction of the works, Mr. Wolfe Barry stated, very much depended on the weather and on the time of the year when the outer parts of the works were in hand, but the whole of the works would probably take from eight months to a year to complete. It was strongly urged that the work should be done continuously and expeditiously, and for that purpose should be let to a contractor of experience in that class of work and who had the means and plant to deal effectively with the contract.

Widnes Bridge Scheme Discouraged.

Addressing the members of the Widnes Chamber of Commerce, Mr. J. H. Smith, of the Cheshire County Council, declared that there was not the remotest chance of securing the carrying through of the project for a new bridge across the River Mersey to connect Runcorn with Widnes.

Notes from the North—continued

Widnes Corporation appears to be satisfied that the present Transporter Bridge will be equal to all normal demands, and, of course, enjoys a financial benefit from the operation of the transporter.

It was, however, from the Runcorn Chamber of Commerce came the suggestion that Widnes might join in a committee of enquiry on the possibilities of a new bridge. It is unlikely that anything more will be heard of the proposal.

Poulton Bridge.

At a meeting of representatives of the Wallasey Corporation and the Birkenhead Corporation, terms were tentatively agreed to by the local authorities concerned with the Mersey Docks and Harbour Board, to free the Poulton Bridge from tolls. It was also decided to approach the Ministry of Transport for a grant towards the cost. The cost of making Poulton Bridge toll-free has not been made public, but it is understood Birkenhead is to pay 60 per cent. and Wallasey 40 per cent. of the total cost when the final figure has been ascertained.

Sewage into the Mersey.

Mr. Edwin Thompson, J.P., in his presidential address to the Society of Chemical Industry, referred to the investigation that was being carried out at the cost of the Merseyside Local Authorities, the Mersey Docks and Harbour Board, and other interested undertakings, with the object of determining the effect of discharges of crude sewage into the Mersey Estuary on the amount and nature of silt and other matter deposited. It had been stated that the presence of sewage in the waters of the estuary caused rapid sedimentation of suspended solids and rendered the deposits more difficult to dredge. The chemical section dealt with the methods of treatment of sewage, positions of outfalls, and volumes of sewage discharged into the estuary and also trade effluents. The biological section had consisted of a survey of the tidal sand and mud banks in the estuary with the object of distinguishing between banks which were more or less permanent and those which were subject to frequent movement. It would, of course, be a considerable time before the River Mersey investigation was completed.

During the years 1929 to 1933 a survey of the River Tees was made, and the final report describing the results of the biological and chemical observations and experiments would shortly be published.

Lytham Landing Stage.

The Ribble Committee of the Preston Corporation has received a letter from the Town Clerk of Lytham St. Annes describing a proposal to construct a landing stage on the foreshore on the east side of Lytham Pier, in connection with the mussel purification plant already erected, at the joint expense of the Lytham St. Annes Council and the Lancashire County Council, and asking for the approval of the Corporation. Preston Corporation approves the scheme.

Preston Dock.

Traffic returns for the Preston Dock during May show a decrease in the import tonnage of 65,541 tons, compared with 77,098 tons in May last year, but an increase in export tonnage from 16,091 tons in May, 1934, to 17,007 tons last month. The revenue for last month was £18,700, compared with £21,517 in May, 1934.

Encouragement for Transhipments.

Mersey Docks and Harbour Board has approved the following recommendation reducing the dock tonnage rates for vessels discharging small quantities of cargo:—

"Vessels trading inwards to the port from a foreign port, and discharging cargo, the gross weight of which does not exceed 25 per cent. of the vessel's net register tonnage after adding to that tonnage the tonnage of any space occupied by the deck cargo carried by the vessel at the time of her arrival here shall, on becoming liable to dock tonnage rates, be charged the dock tonnage rates reduced as provided below:—

"1. If the vessel trades outwards or departs for a port in the same voyage-class as or a higher rated voyage-class than that which includes the most distant port from which she has traded inwards, dock tonnage rates, assessed in respect of the most distant port to which the vessel shall trade outwards or depart, shall be charged as set out below:—

"(a) If the percentage which the gross weight of cargo discharged bears to the vessel's net register tonnage, after adding to that tonnage the tonnage of any space occupied by deck cargo carried by the vessel at the time of her arrival, does not exceed 10 per cent., then the percentage of full dock tonnage rate chargeable on the vessel's net register tonnage and on the tonnage of any space occupied by deck cargo carried outwards shall be 50 per cent.; if the former exceeds 10 per cent. and does not exceed 15 per cent., then the percentage of rate shall be 60 per cent.; if exceeding 15 per cent., but not 20 per cent., percentage of rate 65 per cent.; if exceeding 20 per cent. but not 25 per cent., percentage of rate 70 per cent.

"And (b) the full dock tonnage on each gross ton of cargo discharged in the port."

Maryport Harbour Commissioners.

Mr. J. T. Grisdale, Receiver for the Maryport Harbour Commissioners, in his report for the Maryport Harbour for the year ending 25th March, states that the trade of the port continues to fall, the receipts for the year amounting only to £2,910, as compared with £3,584 for the previous year.

Liverpool Wool Trade.

Over thirty importers of Australian wool from Bradford and their Australian buyers visited the Mersey Docks as guests of the Mersey Docks and Harbour Board. They boarded the Dock Board tender "Galatea" at the Prince's Landing Stage, in charge of leading members and officials of the Port Authority, and were taken for a six-hour cruise in the Liverpool docks and bay. Among the members of the Dock Board were Messrs. H. Sutton Timmis, E. B. Orme, L. A. P. Warner, C. B. E. (general manager and secretary), and Col. T. H. Hawkins, his principal assistant.

Over thirty Manchester traders also paid a visit to Liverpool as guests of the Mersey Docks and Harbour Board. They boarded the "Galatea" at the Prince's Landing Stage and were taken a cruise up and down the river, and afterwards to the lightships and sea channels. Colonel Beazley and Mr. Maurice Hulme, members of the Dock Board, and Col. T. H. Hawkins (principal assistant to the general manager), acted as hosts.

Manchester Dry Docks.

Manchester Dry Docks Company, which owns dry docks, ship and engine-repairing works, etc., at the Port of Manchester, reports that earnings during the year ended April 30th, leave a balance available for distribution of £18,718, against £18,521 a year ago. An ordinary dividend of five per cent., as for each of the three previous years, has been declared, and £5,000 is transferred to reserve. The fund is thus increased to £52,500, against the issued capital of £299,509.

Whitehaven Harbour Board.

Mr. J. H. Cant has been re-elected chairman, and Mr. E. L. Nanson vice-chairman at the annual meeting of the Whitehaven Harbour Board. Mr. Cant mentioned that a good feature was that the output of coal at the Whitehaven pits was improving. The speaker also alluded to the grant made by the Special Area Commissioner to Maryport Harbour, and added that he thought Whitehaven's turn for a grant was due.

Commenting on the accounts, Mr. T. S. Durham said receipts for last year were up £3,900 and expenditure had increased by £1,000. The position at the harbour was improving.

Liverpool Fish Dock Idea.

Further enquiries are being made by a committee of the Liverpool City Council as to the feasibility of establishing, with the prospect of success, a fish dock at Liverpool.

According to advocates of the scheme, Liverpool is the natural fish-distributing centre for one of the most populous areas in the country, and they see no reason why other fishing ports should not be out-rivalled as regards speed of service and freshness of commodity.

On the other hand, there are others who contend the country is already well supplied with highly-developed and efficient fishing ports, which have been planned and developed exclusively for the benefit of the trade.

The points to be carefully considered and which require answering before the scheme is proceeded with include:—

1. Does Liverpool Corporation think that the trawler owners, merchants and curers, will leave the ports where they are already well established, and where they are well equipped with the necessary distributing facilities?

2. Will the establishment of a fishing port give relief to the acute unemployment problem of the fishing industry?

3. What is the feeling of the Trawler Owners' Association on the matter?

4. What is the attitude of the railway companies to the scheme? Do they regard same with pleasure, in view of the fact that they have considerable capital invested in Hull, Fleetwood, etc.,—ports they have developed for the industry?

Recently, Birkenhead Council had such a scheme in mind, but, after giving the idea and the cost of same consideration, the idea was abandoned.

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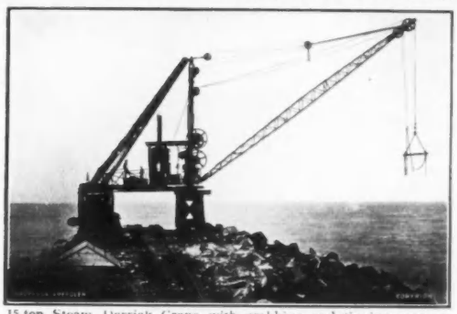

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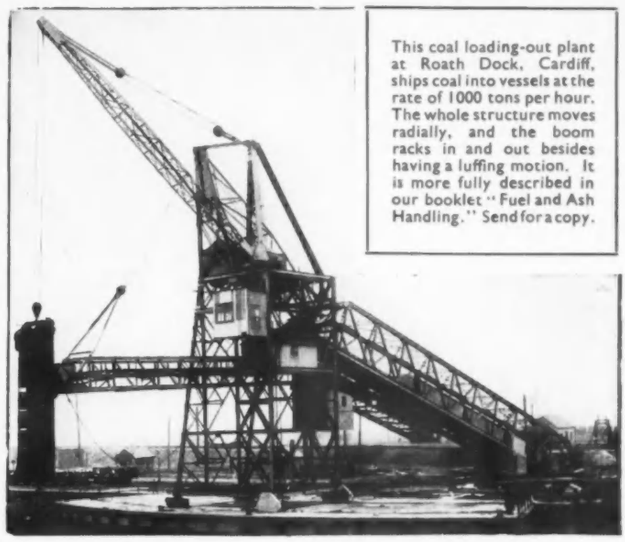

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Creosoted Douglas Fir for Marine Construction

THE strength and resilience of timber for harbour works, and the ease with which existing works in timber may be altered to meet changing conditions, make it, from many points of view, the ideal material for dock and harbour construction. Its proneness to destruction by marine borers has been its great disadvantage.

Two years ago the Southern Railway commenced exhaustive tests to ascertain the reaction of the best-known marine-construction timbers to the attack of marine organisms. Fourteen timbers were selected, including greenheart, pyinkado, teak, karri, jarrah, ekki, blue gum, turpentine, as well as creosoted Douglas fir and creosoted Scots pine. These were immersed in Dover Harbour, where the attack of chelura, limnoria and teredo is severe.

Inspections have been made from time to time in the presence of representatives of various interested authorities, including the Forest Products Research Laboratories of Princes Risborough, and the progress of attack carefully noted. The third inspection, which has just been made, shows that all the hardwoods, excepting pyinkado, have been attacked more or less severely in the two years' immersion. The two creosoted softwoods alone are untouched. Both were treated with 14 lbs. of creosote to the cubic foot.

These tests serve to reaffirm experience in the Falmouth Harbour works, where creosoted Douglas fir has been used over the past ten years, and in Canada and the United States where the use of timber in marine construction has been the subject of exhaustive study, and where it has been found that properly creosoted Douglas fir will withstand marine attack indefinitely. In San Francisco Harbour, for example, which is infested with marine borers, creosoted Douglas fir piling, which had been in place for 29 years, was pulled up to make way for new harbour development. It was found to be in such excellent condition that the greater proportion of it was re-driven in new harbour works. The only timbers which could not be used again were those damaged in being pulled up, or which had suffered damage while in place, by collision or otherwise, so that the raw wood had been exposed.

Failure of creosoted timber to withstand attack by marine organisms is due either to improper creosoting or improper handling after treatment, leaving raw wood to invite attack. Timber must be given a sufficient impregnation to insure proper penetration; and it must not be handled after treatment with sharp instruments, which penetrate beyond the depth of the creosote.

For works which will be exposed to the attack of teredo, limnoria and chelura it is essential that an impregnation of not less than 12 lbs. per cubic foot with a minimum penetration of $\frac{3}{4}$ in. be obtained.

Douglas fir which, because of its strength and the large sizes in which it is available, is the logical timber for marine construction, is handicapped by the impression abroad in England that it is impossible to impregnate it with more than 6 to 8 lbs. of creosote per cubic foot. Unfortunately, with the creosoting methods used, this is too often true, and treated timber is turned out in which the penetration obtained is not more than $\frac{1}{4}$ in. or even $\frac{1}{8}$ in.—treatment which, in fact, amounts to little more than surface painting.

With proper treatment there is no difficulty in impregnating Douglas fir with up to 20 lbs. of creosote per cubic foot, nor in obtaining a uniform penetration of $\frac{3}{4}$ in. The achievement of proper penetration is, however, dependent on several things:—

1. Thorough seasoning of the timber.
2. Incising.
3. Proper temperatures and pressures during treatment, and
4. Sufficient time in the cylinder.

Timber is frequently taken direct from the log pond to the creosoting cylinder for treatment without air-seasoning, or seasoning in the cylinder. This is bad practice. Two things cannot occupy the same place at the same time, and if the wood cells are filled with water, there is no place for creosote oil. If timber has not been thoroughly air-seasoned before treatment, there remains but one method of overcoming the deficiency, that is seasoning in the cylinder. This is accomplished by holding the timber in creosote in the cylinder, under a minimum vacuum of 20 ins., at temperatures of not less than 175° F., and not more than 200° F. until the rate of evaporation is approximately 1/10th of a pound per cubic foot per hour.

If the timber is already thoroughly seasoned it should be placed in a bath of creosote oil, heated gradually to not more than 190° F., and held at that temperature for not more than 6 hours. Both of these treatments are prior to any pressure being applied in the cylinder.

It is impossible to satisfactorily creosote Douglas fir, excepting round piling, without first incising it. This is done without impairment of strength. It consists merely of $\frac{3}{4}$ in. by $\frac{1}{4}$ in. incisions, placed 2 ins. apart longitudinally and 1 in. apart horizontally, and contributes materially to the even and consistent penetration obtained in properly-creosoted timber. If round piling is used incising is not necessary as the sap-wood takes the creosote readily.

All timbers to be used below high-water level should receive a Full Cell treatment of not less than 12 lbs. per cubic foot, and timbers used above high-water level, an Empty Cell treatment of not less than 8 lbs. per cubic foot, except pieces of 80 sq. in. or less in cross-section, which should receive not less than 10 lbs. per cubic foot by the Empty Cell process. Specifications should stipulate the amount of creosote per cubic foot required, as for example:—

SIZE OF TIMBERS	EMPTY CELL PROCESS	FULL CELL PROCESS
8 in. by 8 in. and over	8 lbs. per cu. ft.	12 lbs. per cu. ft.
4 in. by 4 in. up to 8 in. by 8 in.	12 lbs. ,,	16 lbs. ,,

In the Full Cell treatment, after the preliminary seasoning and heating, pressure is developed to a maximum of 175 lbs. per sq. in. until the desired amount of preservative has been absorbed. The temperature of the preservative during pressure should not be less than 160° F., nor more than 200° F., and should average at least 180° F. After the pressure period is completed, the preservative is drawn from the cylinder and a vacuum of at least 20 ins. created and maintained until the preservative will not drip from the material.

In the Empty Cell process the wood is subjected, after seasoning, to air pressure of 50 to 100 lbs. per sq. in., after which and without releasing pressure, creosote oil is forced into the timber in sufficient quantity to insure, when pressure is released and the "kick-back" of creosote by the air imprisoned in the wood occurs, the specified net retention of creosote per cubic foot of wood.

The importance of proper temperatures and pressures cannot be too greatly stressed. The idea that creosote treatment deteriorates the strength of timber owes its existence to the employment of improper methods. An attempt is often made to overcome inadequate temperatures by applying excessive pressure, with resulting damage to the wood cells. Similarly too great heat is injurious. It is in order to avoid this that a vacuum is employed to reduce the boiling point of the water.

Finally, it is of supreme importance to allow sufficient time in the cylinder. The practice general in Canada and the United States is a 24-hour cycle, of which 16 hours is spent in getting all moisture out of the timber.

Publications Received

Messrs. Spencer (Melksham) Ltd., Engineers and Contractors, Melksham, Wilts., have recently issued a very useful and attractively-produced publication, which describes and illustrates the various plant which they have constructed for the purpose of handling minerals.

The various plant described in this publication is of a most varied nature, showing as it does conveyors used for handling coal, grain, rock, ore and stone. Illustrations are also given of coal-tipping plant and portable conveyors.

Any of our readers who are desirous of obtaining this publication can do so by application to Messrs. Spencer (Melksham) Ltd., and mentioning this journal.

* * * *

A very interesting booklet, No. 6248b, has recently been issued by Demag Aktiengesellschaft, Duisburg, and this booklet describes Demag pile drivers, rock breakers and pile extractors. The booklet gives a very full description of the many advantages derived from using Demag pile drivers, and this description is accompanied by illustrations showing the pile driver at work in many different spheres. The rock breakers and pile extractors are also described very fully and suitably illustrated.

If any of our readers are desirous of obtaining this booklet they can do so by application to Messrs. Demag Aktiengesellschaft, and mentioning this journal.